

*FINAL*

**ENVIRONMENTAL ASSESSMENT**

**ADDRESSING THE CONSTRUCTION AND OPERATION OF A UNIT  
TRAINING EQUIPMENT SITE AND THE ADDITION OF TWO NEW  
BUILDINGS AT THE REGIONAL TRAINING INSTITUTE**

**AT**

**CAMP EDWARDS, MASSACHUSETTS**



**MASSACHUSETTS ARMY  
NATIONAL GUARD**

**APRIL 2013**

## Environmental Assessment Organization

This Environmental Assessment (EA) describes the Massachusetts Army National Guard's (MAARNG) proposal to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

As required by the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*), the Council on Environmental Quality Regulations Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508), and 32 CFR Part 651 (*Environmental Analysis of Army Actions*, Final Rule), the potential effects of the Proposed Action are analyzed. This EA will facilitate the decisionmaking process by the MAARNG and the National Guard Bureau regarding the Proposed Action and its considered alternatives, and is organized as follows:

- **EXECUTIVE SUMMARY:** Describes the Proposed Action and its considered alternatives; summarizes environmental, cultural, and socioeconomic consequences; and compares potential effects associated with the two considered alternatives, including the No Action Alternative.
- **SECTION 1 PURPOSE OF AND NEED FOR THE PROPOSED ACTION:** Summarizes the purpose of and need for the Proposed Action, provides relevant background information, and describes the scope of the EA.
- **SECTION 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES:** Describes the Proposed Action and alternatives.
- **SECTION 3 AFFECTED ENVIRONMENT:** Describes relevant components of the existing environmental, cultural, and socioeconomic setting (within the Region of Influence) of the considered alternatives.
- **SECTION 4 ENVIRONMENTAL CONSEQUENCES:** Identifies individual and cumulative potential environmental, cultural, and socioeconomic effects of implementing the considered alternatives; and identifies proposed mitigation and management measures, as and where appropriate.
- **SECTION 5 COMPARISON OF ALTERNATIVES AND CONCLUSIONS:** Compares the environmental effects of the considered alternatives and summarizes the significance of potential individual and cumulative effects from these alternatives.
- **SECTION 6 REFERENCES:** Provides bibliographical information for cited sources.
- **SECTION 7 ACRONYMS AND ABBREVIATIONS:** Lists acronyms and abbreviations used in the EA.
- **SECTION 8 LIST OF PREPARERS:** Identifies document preparers and their areas of expertise.
- **SECTION 9 AGENCIES AND INDIVIDUALS CONTACTED:** Lists agencies and individuals contacted during preparation of this EA.

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**Funding Source:** MILCON

**Proponent:** MAARNG

**Fiscal Years:** 2013 for UTES component; 2014 for RTI component

## Environmental Assessment Signature Page

LEAD AGENCY: National Guard Bureau (NGB)

COOPERATING AGENCIES: None

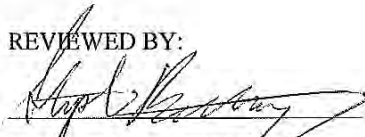
TITLE OF PROPOSED ACTION: Construction & Operation of a Unit Training Equipment Site & The Addition of Two New Buildings at The Regional Training Institute, Camp Edwards, MA.

AFFECTED JURISDICTION: Camp Edwards, Barnstable County, Massachusetts

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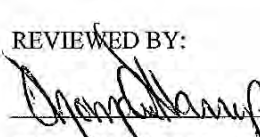
PROPONENT: Massachusetts Army National Guard (MAARNG)

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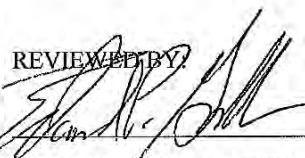
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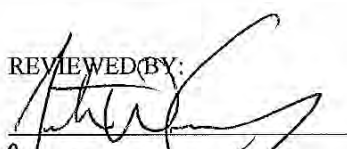
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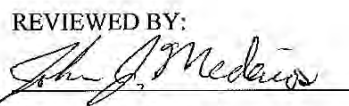
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DOCUMENT DESIGNATION: Final Environmental Assessment & Draft Finding of No Significant Impact

**ABSTRACT:** The NGB and MAARNG propose to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards, Massachusetts. This Environmental Assessment (EA) addresses the potential environmental, socioeconomic, and cultural impacts of this proposal and its alternatives. The Proposed Action is necessary to support the MAARNG federal and state missions. The proposed construction will provide the MAARNG with proper facilities and equipment to conduct the training and maintenance required for mission readiness.

This EA evaluates the individual and cumulative effects of the Proposed Action and the No Action Alternative with respect to the following criteria: geographic setting and land use, air quality, noise, geology, soils, topography, water resources, biological resources, cultural resources, socioeconomic environment, infrastructure and hazardous and toxic materials/wastes.

The evaluation performed in this EA concludes that there would be no significant adverse impact, either individually or cumulatively, to the local environment or quality of life associated with the implementation of the Proposed Action, provided that mitigation measures specified in the EA are implemented.

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**AT**  
**CAMP EDWARDS, MASSACHUSETTS**

**UTES Project Number:** 250065 for Fiscal Year 2013  
**RTI Project Number:** 250095 for Fiscal Year 2014

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## EXECUTIVE SUMMARY

### INTRODUCTION

This Environmental Assessment (EA) describes the Massachusetts Army National Guard's (MAARNG) proposal to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

This EA has been prepared to comply with the requirements of the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code Section 4321–4347); the Council on Environmental Quality's (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500–1508); and the *Army National Guard Manual for Compliance with the National Environmental Policy Act of 1969 (NEPA Handbook October 2011 edition)*.

### PURPOSE AND NEED

The purpose of the Proposed Action is to provide a new UTES for the maintenance and storage of tactical and engineering vehicles and training equipment of the MAARNG assigned to Camp Edwards and to provide additional classroom training, barracks, and administrative space that fully support the mission of the RTI of the MAARNG.

The Proposed Action is needed to provide the MAARNG with a modern and appropriately sized UTES that provides a functional workspace for efficient vehicle and equipment maintenance. The current facility has substandard work bays, no cranes, and limited storage and administrative space that impacts on troop morale and effects equipment and ultimately soldier and mission readiness. The Proposed Action also is needed to provide the RTI of the MAARNG with additional modern classroom, administrative, and lodging space to improve training effectiveness and capabilities. The current RTI is not conducive to a professional learning environment. Classrooms are cramped and inadequate and fall short of supporting the training centers classroom space requirement by 50 percent. Current billeting is so substandard that a waiver is in place in order for it to be accepted for use by an RTI.

### PUBLIC INVOLVEMENT

NEPA ensures that environmental information is made available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if proponents provide information on their actions to state and local governments and the public and involve them in the planning process. The Intergovernmental Coordination Act and Executive Order 12372, *Intergovernmental Review of Federal Programs*, require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal.

The preparation of this EA is being coordinated with appropriate Federal, state, and local agencies. Agency and public input has been obtained during the first of two 30-day comment periods. During the initial comment period, all comments submitted by agencies, organizations, or the public on the Proposed Action or Draft EA itself have been considered. Because this EA has concluded that there are no significant effects, this EA is expected to be finalized and a draft FNSI will be prepared. The Final EA and Draft FNSI will then be made available during another 30-day period. Notices of comment periods and the availability of this EA for public review will be advertised in local newspapers.

## DESCRIPTION OF THE PROPOSED ACTION

Under the Proposed Action, the MAARNG would construct and operate a replacement UTES with associated infrastructure and facilities and construct and operate two additional buildings for the Massachusetts RTI at Camp Edwards, Massachusetts. The UTES and RTI projects would be distinct components of this Proposed Action and would be completed on schedules independent from one another. The following paragraphs describe the Proposed Action by the two components.

### UTES

The UTES component of the Proposed Action would entail the construction of a replacement UTES at the southwestern corner of the former Boeing Michigan Aeronautical Research Center (BOMARC) Missile Complex. The proposed UTES would be a single-story facility that would measure 49,044 square feet (ft<sup>2</sup>) and would be constructed as a permanent masonry-type facility, with sloped standing seam roof, concrete floors, and energy-efficient mechanical and electrical equipment meeting the standards of Leadership in Energy Environmental Design (LEED) Silver. The facility would include eight vehicle work-bays, each measuring 1,024 ft<sup>2</sup>, and a central administration area. The central administration area would house offices, a fitness room, latrines, supply and tool storage areas, a classroom, a conference room, small arms areas, and utility areas. The proposed facility would comfortably provide for the needs of the 89 vehicles currently assigned to the existing facility.

The proposed UTES would be constructed approximately 1,200 feet to the west of the existing UTES (Building 4601) at the former BOMARC Missile Complex. The former BOMARC Missile Complex is an approximately 70-acre rectangular area approximately 1 mile to the north of the U.S. Coast Guard Air Station Cape Cod runway complex and is accessible from Greenway Road. The Greenway residential neighborhood is immediately to the east and a vehicle wash-rack and the Camp Edwards fuel station are immediately to the west of the former BOMARC Missile Complex. The former BOMARC Missile Complex is considered part of the Cantonment Area of the Massachusetts Military Reservation (MMR) and outside of the Upper Cape Water Supply Reserve.

Most of the former BOMARC Missile Complex is flat and level. Several drainage swales are on the western portion of the former complex, and a storm water detention basin has been constructed toward the center. Two other storm water detention basins are near the southwest corner. Vegetation at the former complex consists of small trees and shrubs but is limited to the drainage swales and wooded areas surrounding the perimeter. Most of the area is covered with crushed stone, gravel, and pavement, and the complex is generally devoid of exposed topsoil. A number of groundwater monitoring wells have been installed as part of an ongoing clean-up effort to observe groundwater contamination that has resulted from former operations at the complex.

The proposed UTES area formerly contained a number of structures associated with the BOMARC missile launch system. Shelters for Type I and Type II Launchers were located at and adjoining the area for the proposed UTES. These structures were demolished between 2002 and 2006. Following their demolition, concrete and crushed stone surface was placed across much of the surface. Drainage swales are around the perimeter of the pavements to handle storm water.

The proposed UTES would be constructed adjacent to the primary training site, wash-rack, and fuel station, and it would be in close proximity to the Camp Edwards training areas. All utilities including electric power, natural gas, communications, water, and sanitary sewer are already available to the area surrounding the proposed facility and would be extended to the facility. One diesel-fueled, approximately 300-kilowatt, emergency electrical generator would be installed to provide a backup supply of electrical power.



An approximately 14-acre storage lot would be constructed surrounding the proposed UTES for the storage of government-owned vehicles and equipment. This lot would include approximately 1.8-acres of concrete pavement with the remainder composed of flexible surface and crushed stone. A portion of the materials to be used for the flexible surface would consist of Reclaimed Asphalt Pavement (RAP) that would be generated as part of a supplemental environmental project to remove pavement associated with past infrastructure throughout the cantonment area. The RAP would be used in a variety of applications including as part of the flexible paving sub-base and binder aggregate and blended with the crushed stone in unpaved areas associated with the proposed UTES facility.

The storage lot would be secured with a fence extending around the perimeter, and necessary storm water-handling infrastructure would be included to transport storm water to the existing drainage swales. An asphalt-paved privately owned vehicle (POV) parking lot with the capacity for 70 automobiles would be constructed immediately to the west of the proposed UTES. The POV parking lot would be outside of the security fence and designed in accordance with anti-terrorism/force-protection (AT/FP) parking standoffs. Vehicle access to the proposed UTES would be from the south using Dolan Road. Secondary access roads from the west would provide direct access to the installation's training areas, wash-rack, and fuel station. Appropriate landscaping would be conducted following the construction of the proposed UTES and would include the construction of approximately 13,400 ft<sup>2</sup> of new sidewalks.

Following the construction of the proposed UTES, the existing UTES (Building 4601) would be demolished and an approximately 20,000-ft<sup>2</sup> controlled-humidity building would be constructed on the site of the former UTES building. Alterations to the parking area at the existing UTES would be made to accommodate the proposed controlled-humidity building.

In total, no more than 15 acres would be disturbed from the construction of the proposed UTES, demolition of the existing UTES, and the construction of the controlled-humidity building. Because the areas to be disturbed are already covered with pavement and crushed stone and because following construction the amount of concrete and crushed stone surface would be similar to current conditions, no net change in the amount of impervious and semi-impervious surface would be expected. Construction and demolition for the UTES component of the Proposed Action is anticipated to occur during Fiscal Year (FY) 2013. The MILCON project number for the UTES component of the Proposed Action is 250065.

## **RTI**

The RTI component of the Proposed Action would entail the construction of an education building and a barracks for the RTI. The proposed buildings would be sited in the 5200 Area of Camp Edwards, which is east of Turpentine Road and adjacent to the existing RTI buildings. The 5200 Area already contains several RTI facilities, including the existing RTI barracks (Building 5232) and the existing RTI administrative and classroom building (Building 5222). There are other barracks at the 5200 Area that are under the control of other agencies and occasionally are used by the RTI. A dining facility (Building 5220) is located within the 5200 Area to provide food service for personnel staying in the barracks.

The proposed education building would measure 25,913 ft<sup>2</sup> and would be constructed partially on the northern portion of the existing RTI parking area and partially on the grass area immediately to the north of the parking lot. The proposed facility would be positioned between the existing dining facility (Building 5220) and Turpentine Road and would be three stories in height. The proposed facility would include numerous classrooms, a break area, offices for staff, a teacher preparation area, and a physical fitness area. The proposed education building would provide a modern work and teaching environment for the RTI and would eliminate the design deficiencies currently experienced at Building 5222.

The proposed barracks would measure 32,125 ft<sup>2</sup> and would be constructed partially on the southern portion of the existing RTI parking area and partially on the grass area immediately to the south of the parking lot. The proposed facility would be positioned adjacent to Buildings 5222 and 5224. The proposed barracks would be three stories in height and include 47 rooms designed for double occupancy. Lounges would be on each floor, and the first floor would contain a mechanical room, laundry room, and an office. The barracks would be used for either enlisted or officer personnel, and it would provide modern housing that would eliminate the need for the RTI to use barracks that are under the control of other departments and agencies.

Both buildings proposed for construction would be concrete masonry structures with steel-gabled joists, steel perimeter beams, and corrugated metal decks. They would be very similar in appearance to the current structures of the 5200 Area. In addition, overall building footprints would be similar to existing buildings, and the proposed facilities would be situated in a manner that maintains the campus-like character of the 5200 Area. Both proposed buildings would achieve an energy-efficiency rating of LEED Silver and include all appropriate AT/FP measures. All utilities, including electric power, water, and sanitary sewer, are already available to the area surrounding the proposed facilities. Appropriate landscaping would be conducted following the construction of the proposed facilities and would include the construction of approximately 4,000 ft<sup>2</sup> of new sidewalks.

Under the current design, the construction of these buildings would require the existing RTI parking lot to be reconfigured in order to meet AT/FP parking standoff requirements. Approximately 1,350 ft<sup>2</sup> of new concrete paving and 300 linear feet of new curbs would be constructed to reconfigure the parking area. RAP would also be used, as appropriate, in paving applications. However, the reconfiguration of the parking lot would still result in the removal of 30 car parking spaces and 7 bus parking spaces. The loss of these parking spaces would leave 142 car spaces and no bus parking spaces at the RTI campus. Construction for the RTI component of the Proposed Action is anticipated to occur during FY 2014. The MILCON project number for the RTI component of the Proposed Action is 250095.

## **ALTERNATIVES CONSIDERED**

According to guidance provided by NEPA, the Environmental Analysis of Army Actions (32 CFR 651), and the *Army National Guard Manual for Compliance with the National Environmental Policy Act of 1969 (NEPA Handbook October 2011 edition)*, an EA or an Environmental Impact Statement (EIS) must identify and evaluate reasonable alternatives to a proposed action. The alternatives are to provide a basis from which to compare the Proposed Action with other potential methods of implementation.

## **ALTERNATIVE DEVELOPMENT (SCREENING CRITERIA)**

The MAARNG has developed screening criteria to aid in the identification of alternative sites for the UTES and RTI components of the Proposed Action. These criteria are summarized as follows:

- The proposed UTES should be close to the training area of Camp Edwards to minimize traffic, fuel consumption, and the use of existing paved roads by tracked vehicles. While tracked vehicles are not currently assigned to Camp Edwards, their future use is possible, and these vehicles can have deleterious effects on pavement.
- The proposed UTES should be in close proximity to existing utility services (e.g., water, sewer, and electric), the vehicle wash-rack, the fuel station, existing parking areas, and roads leading to the training area.
- The location of the proposed UTES should support the maintenance and issuance of military vehicles and equipment to units that train at Camp Edwards.

- The proposed UTES should be large enough to provide sufficient equipment storage space, adequate and efficient maintenance areas, and administrative space for personnel assigned to Camp Edwards.
- The proposed UTES should be able to accommodate one work-bay for every three mechanics assigned to Camp Edwards. It should be designed to allow vehicles to drive through each work-bay. It should be large enough to enable maintenance on each vehicle type to be conducted with the doors closed.
- The proposed RTI buildings should be in an area of Camp Edwards appropriately zoned for classroom training and barracks.
- The proposed RTI buildings should be in close proximity to the existing RTI facilities (e.g., Buildings 5232 and 5222).
- The proposed RTI buildings should be in close proximity to existing utility services (e.g., water, sewer, and electric) and existing parking areas and be easily accessible by current roads.
- The proposed RTI site should be large enough to provide a sufficient area to incorporate the additional classroom, administrative space, and barracks required.
- The proposed UTES and RTI buildings should be developed in such a way that the natural and cultural resources of Camp Edwards are not affected to the maximum extent possible.
- The proposed UTES and RTI buildings should be constructed at locations that minimize the amount of demolition and do not interfere with existing installation operations.

## **EVALUATED ALTERNATIVES**

This section describes reasonable alternatives that passed the screening criteria and have been retained for further analysis in the EA. This section also describes the No Action Alternative and the Preferred Alternative.

### **No Action Alternative**

The No Action Alternative refers to a continuation of existing conditions without implementation of the Proposed Action. The No Action Alternative is required by CEQ regulations and serves as a benchmark against which the Proposed Action and other alternatives can be evaluated.

Under the No Action Alternative, a replacement UTES and additional buildings for the RTI would not be constructed and the existing facilities would remain in operation. No construction, demolition, or ground disturbance would occur. If this alternative is chosen, then the difficulties and inefficiencies identified above would not be alleviated. The MAARNG would continue to operate in substandard, inappropriately-equipped facilities that would impact on troop morale and effect equipment and ultimately soldier mission readiness. While the No Action Alternative does not satisfy the purpose of or need for the Proposed Action, it will be analyzed in detail in this EA in accordance with CEQ regulations.

### **The Preferred Alternative**

The Preferred Alternative is the Proposed Action as described above. The proposed UTES would be constructed at the southwestern corner of the BOMARC site in the vicinity of the existing UTES. The proposed RTI buildings would be constructed at the 5200 Area of the installation in the vicinity of the existing RTI buildings.

## ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER DETAILED ANALYSIS

This section identifies and briefly describes alternatives that were considered but not carried forward for detailed analysis because they were not found to be reasonable.

### Alternative Layouts of the UTES at the former BOMARC Missile Complex

Three alternative layouts for the UTES and associated POV parking areas were considered at the former BOMARC Missile Complex. Of these alternative layouts, one was considered the secondary alternative to the preferred layout and the remaining two were considered other alternatives. Each alternative layout would disturb no more than 15 acres at the former BOMARC Missile Complex and each would entail similar construction and demolition actions as the preferred layout. Due to the proximity of each alternative layout to the preferred layout and the largely similar site conditions at each, the environmental effects from these alternative layouts are expected to be the same as the environmental effects from the preferred layout. Therefore, these alternative layouts for the UTES are not carried forward for separate further detailed evaluation in this EA.

### Locate UTES in the 3600 Area

In July 2001, the 3600 Area of the installation was proposed as the location for the UTES in the Final Environmental Impact Report (EIR) for the *Upgrade of Facilities at the Massachusetts Military Reservation*. In the intervening years since the issuance of the Certificate for the Final EIR, the 3600 Area was developed into a Tactical Training Base to meet global military mission requirements. There is no longer sufficient space at the 3600 Area to support the UTES; therefore, this alternative is no longer a viable option and is eliminated from further detailed analysis in this EA.

### Locate UTES in the 2800 Area

The 2800 Area of the installation contains aviation, maintenance, and administrative facilities. This area includes the helicopter (aviation) hangar, the Facilities Engineering building, and Field Maintenance Shop #9. Some of these facilities provide vehicle maintenance, which could be relocated to the UTES following building construction.

The remainder of the 2800 Area is open space and adequately meets the space criteria for the Proposed Action. However, the area is also grassland and has been designated as critical habitat for four state-listed bird species. In addition, the 2800 Area is approximately 2.5 miles from the training areas, fuel station, and wash-rack facilities. Therefore, the 2800 Area fails to meet several of the established criteria, and is eliminated from further detailed analysis in this EA.

### Locate UTES in the 3300 Area

The 3300 Area is a recreation field area and is adjacent to the MMR Golf Course. Although there is adequate space, it is the farthest site from the training areas, fuel station, and wash-rack facilities. Locating the UTES site at the 3300 Area would also disturb areas of pitch pine and grassland. Therefore, the 3300 Area fails to meet several of the established criteria, and is eliminated from further detailed analysis in this EA.

## Locate RTI in the 3400 Area

The 3400 Area of the installation is to the north of the 5200 Area and has been partially cleared from the demolition of an old barracks complex. The area is adjacent to the existing RTI and associated barracks and construction there would not result in effects on natural or cultural resources. The Site Consolidation Plan for Camp Edwards has, however, identified this area for the future consolidation of the Camp Edwards Headquarters, field classrooms, indoor qualifications range, supply warehouse, and other training and support facilities. This would allow commanders, trainers, and trainees to coordinate closely while moving through the training preparations and tasks. The 5200 and 3400 Areas are zoned as training areas on the MMR. However, due to space constraints, the 3400 Area was eliminated from further consideration.

## SUMMARY OF ENVIRONMENTAL IMPACTS

**Table ES-1** provides an overview of the potential impacts that would result from the Proposed Action and the No Action Alternative. Impacts from the Proposed Action are broken down by the UTES and RTI components.

## MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES

Because there are no significant adverse effects, mitigation measures would not be required for the Proposed Action. Standard best management practices (BMPs) for construction- and demolition-related activities would be implemented to minimize the non-significant, adverse effects from the Proposed Action. A summary of these BMPs is included as follows:

- Use water to minimize fugitive particular matter emissions during construction and demolition.
- Performing maintenance on construction and demolition equipment to potentially lessen their noise levels or replace older equipment with newer, quieter equipment. Use improved mufflers, equipment redesign, intake silencers, ducts, and engine enclosures and noise-attenuating shields or shrouds on all equipment and trucks.
- Use exhaust mufflers on compressed air exhaust and use acoustical shielding on stationary equipment when feasible.
- Install silt fencing and sediment traps, apply water to disturbed soil, and revegetate disturbed areas as soon as possible after the disturbance to control erosion, as appropriate.
- Site new facilities to avoid or minimize effects on wetlands and natural resources.
- In the event of a release of hazardous materials, the installation's Spill Prevention, Control, and Countermeasures Plan would be followed to quickly contain and clean up the release.
- Replant areas disturbed with native vegetation or approved grass seed mixtures following construction and demolition activities.
- Allow wildlife to move out of the path of construction equipment.
- Implement properly designed and maintained erosion and sediment controls and storm water management practices during construction to minimize the potential for any adverse effects on wetlands. Implementation of storm water pollution BMPs during and after construction would minimize the potential for adverse effects associated with runoff from the new facilities.
- In the event that archaeological materials or human remains are inadvertently discovered during construction activities, the MAARNG would follow the procedures outlined in Standard Operating Procedure 5 in the installation's Integrated Cultural Resources Management Plan.

**Table ES-1. Overview of Potential Impacts from the Proposed Action and No Action Alternative**

Resource Area	Proposed Action		No Action Alternative
	UTES Component	RTI Component	
Land Use	No adverse effects on land use plans or policies associated with long-term planning would occur. Short- and long-term, minor, adverse effects on land use policies and plans associated with groundwater protection would occur.	No adverse effects on land use plans or policies associated with long-term planning would occur. Short- and long-term, minor, adverse effects on land use policies and plans associated with groundwater protection would occur.	There would be no change in land use conditions and no adverse effects would occur.
Air Quality	Short-term, minor, adverse and long-term, negligible, adverse effects on air quality would occur. Construction and demolition activities would generate air emissions over the short-term. Operation of furnaces and an emergency generator would generate air emissions over the long-term.	Short-term, minor, adverse and long-term, negligible, adverse effects on air quality would occur. Construction activities would generate air emissions over the short-term. Operation of furnaces would generate air emissions over the long-term.	There would be no change in air quality and no adverse effects would occur.
	For all years, air emissions from the Proposed Action are well below the General Conformity Rule <i>de minimis</i> threshold limits, and there would be no impacts on the installation’s air permit requirements.		
Noise	Short-term, minor, adverse effects on the noise environment would be expected from the use of heavy equipment and the introduction of additional vehicle traffic during construction and demolition activities. Long-term, negligible, beneficial effects on the noise environment would be expected because the proposed UTES would allow the MAARNG to conduct maintenance on oversized vehicles indoors.	Short-term, minor, adverse effects on the noise environment would be expected from the use of heavy equipment and the introduction of additional vehicle traffic during construction activities. No long-term effects would occur.	There would be no change in noise conditions and no adverse effects would occur.

Resource Area	Proposed Action		No Action Alternative
	UTES Component	RTI Component	
<b>Earth Resources</b>	Short- and long-term, negligible, adverse effects on earth resources would occur from soil compaction, erosion, and sedimentation. Construction would not substantially alter the geology and topography of the site, and the soils present on site are previously disturbed. Site-specific soil testing would determine if soil limitations exist. Short- and long-term storm water control measures that favor reinfiltration would minimize the potential for erosion and sediment production.	Short- and long-term, negligible, adverse effects on earth resources would occur from soil compaction, erosion, sedimentation, and an increase in impervious surfaces. Construction would not substantially alter the geology and topography of the site, and the soils present on site are previously disturbed. Site-specific soil testing would determine if soil limitations exist. Short- and long-term storm water control measures that favor reinfiltration would minimize the potential for erosion and sediment production.	There would be no change in earth resources and no adverse effects would occur.
<b>Water Resources</b>	Short-term, negligible, adverse effects would occur from the excavation of soils, erosion of disturbed soils, and potential transport of sediment and contaminants during storm water flow events. Ensuring onsite storm water infiltration during construction activities, as required by Section 438 of the Energy Independence and Security Act (EISA), would sustain and recharge groundwater and minimize storm water runoff. No long-term effects on water resources would be expected.	Short-term, negligible, adverse effects would occur from the excavation of soils, erosion of disturbed soils, and potential transport of sediment and contaminants during storm water flow events. Ensuring onsite storm water infiltration during construction activities, as required by Section 438 of the EISA, would sustain and recharge groundwater and minimize storm water runoff. Long-term, minor, adverse effects would occur from an increase in impervious surface.	There would be no change in water resources and no adverse effects would occur.

Resource Area	Proposed Action		No Action Alternative
	UTES Component	RTI Component	
<b>Biological Resources</b>	Short-term, minor, adverse effects on vegetation would occur as a result of habitat loss and invasive species introduction associated with construction and demolition activities. Wildlife would be permanently displaced from the areas where habitat is cleared for construction and temporarily displaced from areas adjacent to the project areas during construction and demolition periods. No effects are expected to occur on listed species. Short-term, minor, indirect, adverse effects on nearby wetlands and waters of the United States would occur as a result of construction and demolition activities.	Short-term, minor, adverse effects on vegetation would occur as a result of habitat loss and invasive species introduction associated with construction activities. Long-term, minor, adverse effects would occur from the permanent removal of grass within the footprint of development and an increase in impervious surfaces. Wildlife would be permanently displaced from the areas where habitat is cleared for construction and temporarily displaced from areas adjacent to the project areas during construction periods. No effects are expected to occur on listed species. No effects on wetlands and waters of the United States would occur.	There would be no change in biological resources and no adverse effects would occur.
<b>Cultural Resources</b>	No effects on cultural resources under NEPA would occur. The cantonment area of Camp Edwards, which includes the Area of Potential Effect (APE), has been determined to have no potential for the preservation of intact archaeological deposits. The existing UTES building and associated complex have been determined not eligible for listing in the National Register of Historic Places (NRHP) by the Massachusetts Historical Commission due to insufficient physical integrity. The MAARNG has consulted with the Mashpee Wampanoag Tribe, and this consultation has determined that there are no resources of traditional, religious, or cultural interest to the tribe at or near the proposed UTES.	No effects on cultural resources under NEPA would occur. The cantonment area of Camp Edwards, which includes the APE, has been determined to have no potential for the preservation of intact archaeological deposits. No NRHP eligible or unevaluated buildings are within the viewshed of the proposed RTI facilities. No resources of traditional, religious, or cultural interest have been identified at or near the proposed RTI buildings.	There would be no change in cultural resources and no adverse effects would occur.



Resource Area	Proposed Action		No Action Alternative
	UTES Component	RTI Component	
<b>Socioeconomics and Environmental Justice</b>	Short-term, minor, beneficial effects on the local economy would occur during construction and demolition from the added economic spending in the region. No long-term effects would be expected. There would be no environmental justice effects.	Short-term, minor, beneficial effects on the local economy would occur during construction from the added economic spending in the region. There would be no environmental justice effects.	There would be no change in socioeconomic and environmental justice conditions and no adverse effects would occur.
<b>Infrastructure</b>	Short-term, minor, adverse effects on the transportation network would occur due to increased traffic and parking lot use associated with construction and demolition equipment and contractor vehicles. Short-term interruptions of utilities could be experienced when buildings are disconnected from or connected to the existing utility services. Long-term, minor, adverse effects on utilities would be expected due to the increase in building space.	Short-term, minor, adverse effects on the transportation network would occur due to increased traffic and parking lot use associated with construction equipment and contractor vehicles. There would be a reduction of 30 car and 7 bus parking spaces at the existing RTI parking lot. The loss of these parking spaces would leave 142 car spaces and no bus parking spaces at the RTI campus. Short-term interruptions of utilities could be experienced when the proposed buildings are connected to the existing utility services. Long-term, minor, adverse effects on utilities would be expected due to the increase in building space.	There would be no change in infrastructure conditions and no adverse effects would occur.
<b>Hazardous Materials and Wastes</b>	Short-term, minor, adverse effects on hazardous materials and wastes would occur during construction and demolition activities. Construction and demolition activities have the potential to disturb asbestos-contain materials (ACMs), lead-based paint, and polychlorinated biphenyls. No Installation Restoration Program (IRP) or Impact Area Groundwater Study Program (IAGWSP) sites would be disturbed.	Short-term, minor, adverse effects on hazardous materials and wastes would occur during construction activities. Construction activities have the potential to disturb ACMs in buried utility lines. No IRP or IAGWSP sites would be disturbed.	There would be no change in hazardous materials and wastes and no adverse effects would occur.

## CONCLUSIONS

The Proposed Action would provide a new maintenance and storage facility for tactical and engineering vehicles and training equipment of the MAARNG assigned to Camp Edwards and provide additional classroom training, barracks, and administrative space that fully support the mission of the RTI of the MAARNG. Analysis of the potential effects of the Proposed Action shows that the Proposed Action would not have significant effects on the quality of the human environment nor on the natural environment.

Furthermore, implementation of the No Action Alternative would not provide the MAARNG with a modern and appropriately sized UTES that provides a functional workspace for efficient vehicle and equipment maintenance, and it would not provide the RTI of the MAARNG with additional modern classroom, administrative, and lodging space to improve training effectiveness and capabilities. Therefore, the MAARNG proposes to implement the Proposed Action. Based on the analysis contained in this EA, an EIS would not be required and the MAARNG would issue a FNSI.

**FINAL  
ENVIRONMENTAL ASSESSMENT ADDRESSING THE CONSTRUCTION AND OPERATION OF A UNIT  
TRAINING EQUIPMENT SITE AND THE ADDITION OF TWO NEW BUILDINGS AT THE REGIONAL  
TRAINING INSTITUTE AT CAMP EDWARDS, MASSACHUSETTS**

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# 1. Purpose of and Need for the Proposed Action

## 1.1 Introduction

This Environmental Assessment (EA) describes the Massachusetts Army National Guard's (MAARNG) proposal to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts. This EA also describes alternatives to the Proposed Action that have been considered, including the No Action Alternative.

This EA has been prepared to comply with the requirements of the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code [U.S.C.] Section 4321–4347); the Council on Environmental Quality's (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500–1508); and the *Army National Guard Manual for Compliance with the National Environmental Policy Act of 1969 (NEPA Handbook October 2011 edition)*.

This EA analyzes the potential for significant environmental effects associated with the Proposed Action and alternatives, including the No Action Alternative. If the analyses presented in this EA indicate that the Proposed Action would not result in significant environmental or socioeconomic effects, then a Finding of No Significant Impact (FNSI) will be prepared. A FNSI briefly presents the reasons why a proposed action would not have a significant effect on the human environment and why an Environmental Impact Statement (EIS) would not be necessary. If the analyses presented in this EA indicate that significant environmental effects would result from the Proposed Action that cannot be mitigated to insignificance, a Notice of Intent to prepare an EIS would be required or no action would be taken.

## 1.2 Background Information

### 1.2.1 The Massachusetts Military Reservation and Camp Edwards

The Massachusetts Military Reservation (MMR) is an approximately 21,000-acre military training facility, approximately 50 miles southeast of Boston, in the upper western portion of Cape Cod, in Barnstable County, Massachusetts. The MMR includes parts of the towns of Bourne, Mashpee, and Sandwich and abuts the town of Falmouth. U.S. Highway 6 and State Highways 28 and 130 border the MMR to the north, west, and east, respectively. **Figure 1-1** shows the relative location of the MMR.

The MMR is divided into several different components that are managed by different agencies. These components include Camp Edwards, which is managed by the MAARNG; U.S. Coast Guard Air Station Cape Cod; Cape Cod U.S. Air Force Station; a Veterans Administration Cemetery; and several other Federal, state, and local government-managed areas (MAARNG 2010a). **Figure 1-2** shows the locations of the various agencies of the MMR. The MMR is also divided into two primary land use zones. The Upper Cape Water Supply Reserve composes approximately 15,000 acres on the northern portion of the installation, and the Cantonment Area composes the approximately 7,000 acres on the southern portion (MAARNG 2010a).

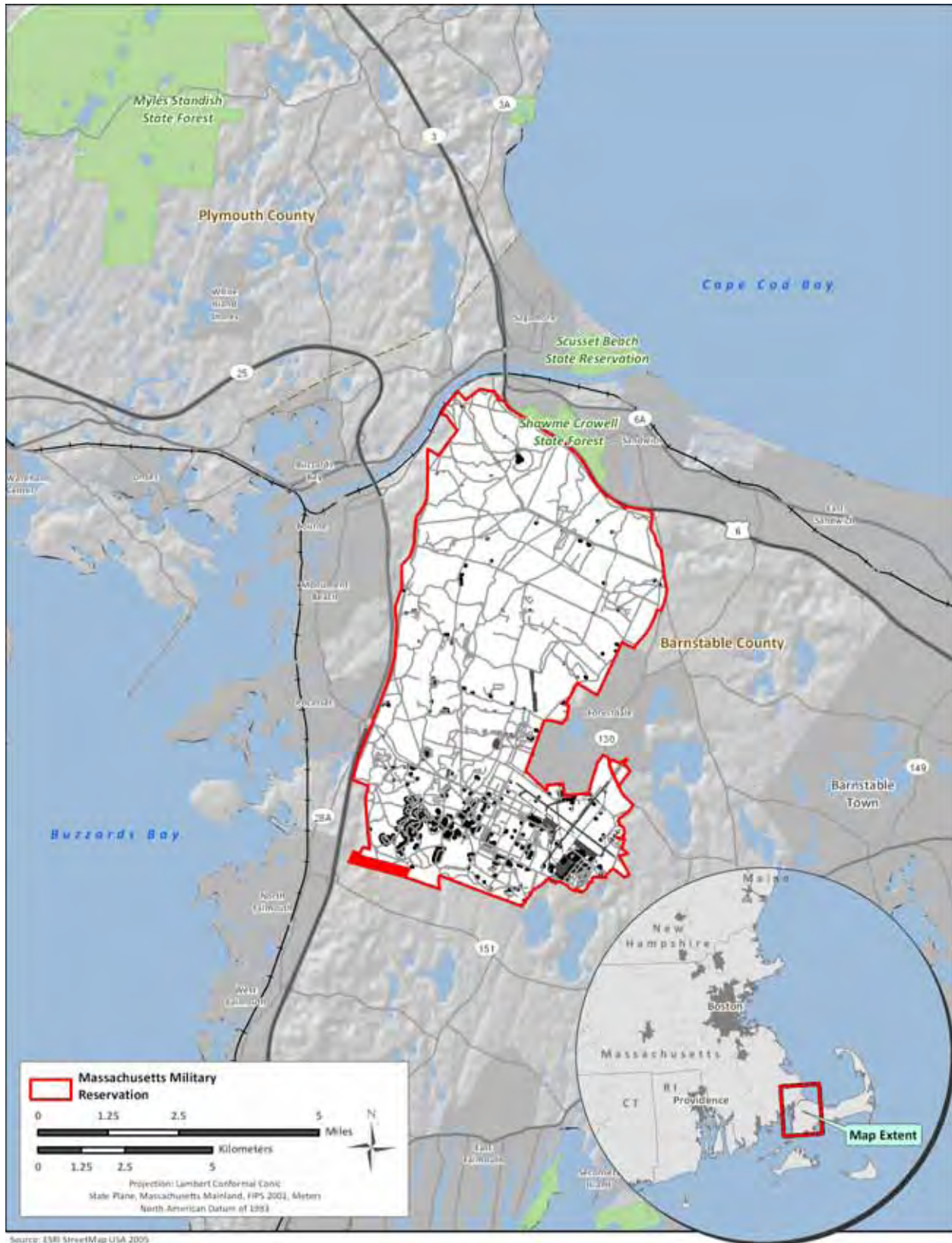
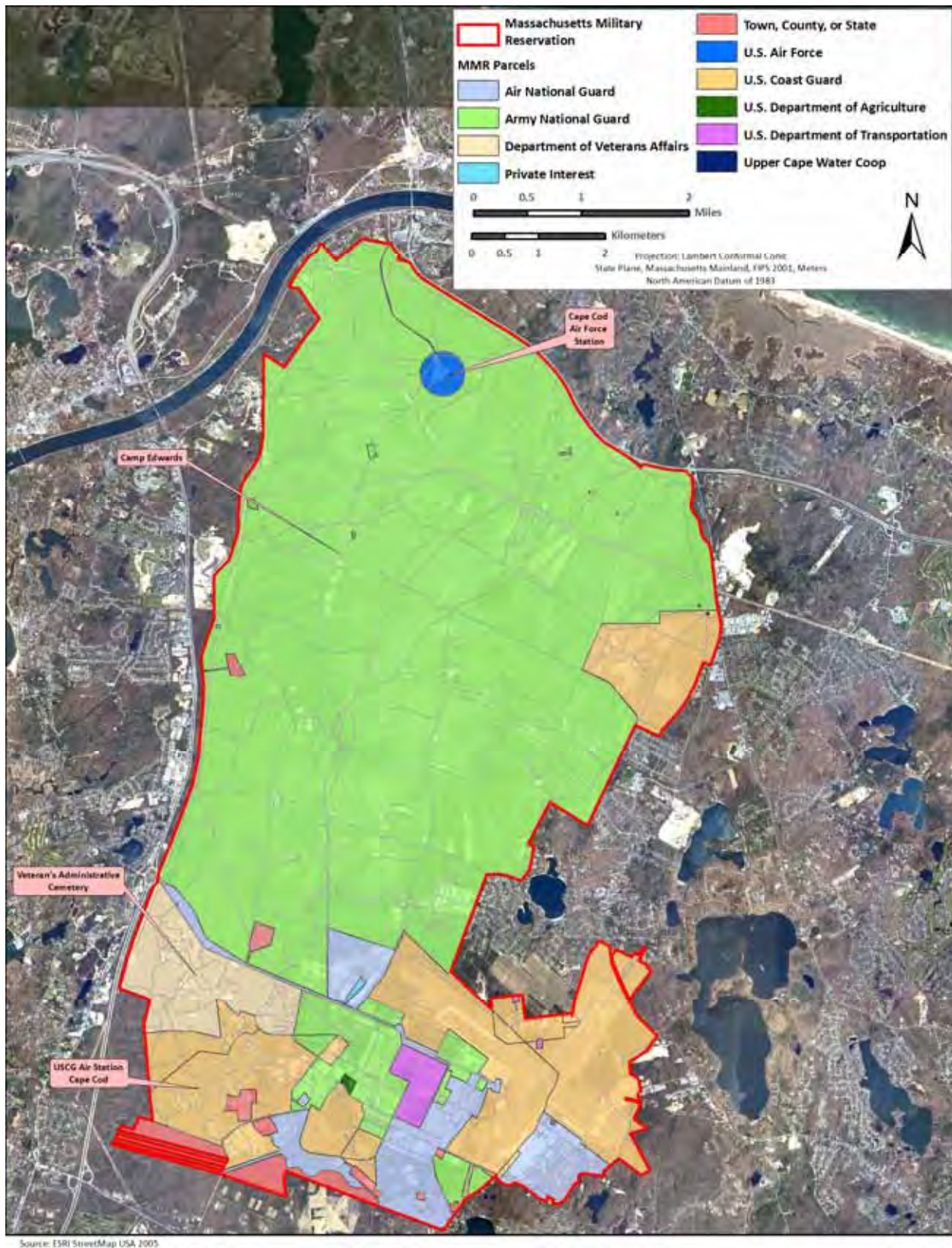


Figure 1-1. Location of the Massachusetts Military Reservation





**Figure 1-2. Location of the Various Organizations on the Massachusetts Military Reservation**

Camp Edwards is an approximately 15,000-acre MAARNG training site within the northern portion of the MMR. The land that currently composes Camp Edwards is owned by the Commonwealth of Massachusetts, which has leased the property to the U.S. Army. In turn, the Army licensed the land to the MAARNG for training (MAARNG 2006a). The current lease held by the Army expires in the year 2051.

### 1.2.2 Unit Training Equipment Site

Camp Edwards stores, maintains, and repairs vehicles and equipment used during military training exercises. The storage of vehicles and equipment at the installation eliminates the need for visiting units to transfer their own vehicles and equipment from armories located throughout the Commonwealth to Camp Edwards. Periodic maintenance and repair to vehicles and equipment is conducted at Camp Edwards' UTES and ensures that vehicles and equipment remain mission ready, functional, and capable to support military training requirements and activities.

The current Camp Edwards UTES is housed in Building 4601 at the former Boeing Michigan Aeronautical Research Center (BOMARC) Missile Complex. Building 4601 was constructed in 1962 as the former BOMARC Vehicle Storage/Composite Building. It is an approximately 6,000-square-foot (ft<sup>2</sup>), flat-roofed, cinder block building connected to an approximately 19,000-ft<sup>2</sup> building of similar construction. The facility supports approximately 40 personnel and the storage, maintenance, and repair of approximately 65 wheeled vehicles and 20 trailers. Existing vehicle work-bays are narrow (i.e., approximately 26-by-30 feet [780 ft<sup>2</sup>]) and do not allow vehicles to be pulled or towed through. A maintenance work-bay at a UTES typically should measure approximately 32-by-32 feet (1,024 ft<sup>2</sup>). In addition, the roof height is inadequate and limits the indoor maintenance and repair of certain types of military equipment. As a result of the lack of adequately sized maintenance areas, many vehicles cannot be maintained indoors. Consequently, certain types of maintenance must be conducted outdoors, even in adverse weather conditions. In general, Building 4601 does not provide a functional workspace for efficient vehicle and equipment maintenance operations. **Appendix A** contains photographs showing the current conditions at Building 4601.

### 1.2.3 Regional Training Institute

The Massachusetts RTI provides Combat Arms, Military Occupational Specialty Qualification, Additional Skill Identifier, Noncommissioned Officer Education System, and other leadership training programs to military personnel at Camp Edwards (GlobalSecurity.org 2010). Classroom training is primarily conducted at Building 5222, and Building 5232 provides housing for the students of the RTI.

Building 5222 is a 21,308-ft<sup>2</sup>, three-floor building that was originally constructed as a barracks but was renovated to provide classroom and administrative offices. Consequently, the structure is poorly suited for use as classrooms. Concrete columns often block view lines and inhibit flexible use of the space. Computer screen viewing is made difficult by the presence of wide window bands. The heating, ventilation, and air conditioning system is difficult and expensive to upgrade due to the low concrete ceilings. **Appendix A** contains photographs showing the current conditions at Building 5222.

Building 5232 is a 25,266-ft<sup>2</sup>, three-floor barracks with 72 rooms (144 beds). It is operated by Camp Edwards; therefore, the RTI must receive a waiver to use this facility. During periods of peak occupancy, there are conflicts of building availability. The building does not meet the minimum standards of the RTI to support the study needs of students.

Based on a validated peak student population of 94, the RTI has an authorized need for 83,720 ft<sup>2</sup> of educational and billeting space. Building 5222 provides less than half of the authorized amount of educational and administrative space, and the RTI does not have any dedicated billeting space.

### 1.3 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide a new UTES for the maintenance and storage of tactical and engineering vehicles and training equipment of the MAARNG assigned to Camp Edwards and to provide additional classroom training, barracks, and administrative space that fully support the mission of the RTI of the MAARNG.

The Proposed Action is needed to provide the MAARNG with a modern and appropriately sized UTES that provides a functional workspace for efficient vehicle and equipment maintenance. The current facility has substandard work bays, no cranes, and limited storage and administrative space that impacts on troop morale and effects equipment and ultimately soldier and mission readiness. The Proposed Action also is needed to provide the RTI of the MAARNG with additional modern classroom, administrative, and lodging space to improve training effectiveness and capabilities. The current RTI is not conducive to a professional learning environment. Classrooms are cramped and inadequate and fall short of supporting the training centers classroom space requirement by 50 percent. Current billeting is so substandard that a waiver is in place in order for it to be accepted for use by an RTI.

### 1.4 Scope of the Environmental Assessment

This EA evaluates the MAARNG proposal to construct and operate a replacement UTES with associated infrastructure and facilities and two additional buildings for the RTI at Camp Edwards. The geographic scope of this EA is the proposed project locations and the local or regional environments potentially effected by construction, demolition, and operation activities associated with the Proposed Action.

#### 1.4.1 History of the Planning and Scoping Process

**UTES.** Initial planning for the UTES component of the Proposed Action can be traced as far back as the mid- to late-1990s when construction of a new UTES was proposed in the Draft Environmental Impact Report (EIR) for the *Upgrade of Facilities at the Massachusetts Military Reservation*. In April 1997, a Certificate found that the Draft EIR did not adequately address the issues required by the scope. This Certificate created a new Special Review Procedure (SRP) for the project. The SRP also required the selection of a Community Working Group (CWG), which was to include representatives of the four affected communities (Falmouth, Mashpee, Sandwich, and Bourne), the Cape Cod Commission, and the various branches of the military stationed at the MMR. In June 1998, then Governor Cellucci directed the MAARNG to withdraw five of the six MAARNG projects. The five withdrawn projects were all within the northern training land acreage of the MMR, while the remaining MAARNG project was the construction of a new UTES within the Cantonment Area.

After a lengthy, comprehensive, and open public process, in September 1998 the CWG issued and adopted its Master Plan Final Report. The CWG Master Plan divided the MMR into two primary land use zones: the Upper Cape Water Supply Reserve and the Cantonment Area. Within the Upper Cape Water Supply Reserve, which composes the northern approximate 15,000 acres of the MMR, permanent protection for water supply, wildlife, and open space is paramount, while compatible military training may continue. The Cantonment Area, composing 5,000 acres in the southern portion of the installation, was identified as the appropriate location for new military and civilian development projects.

Environmental performance standards also were created to protect resources and to manage the activities of the Massachusetts National Guard at MMR. These environmental performance standards were developed with the consensus of many individuals and agencies, form the common basis and understanding for good environmental stewardship, and guide future planning and implementation efforts.

The environmental performance standards included resource specific standards and general activity standards.

Following the issuance of the CWG Master Plan and the creation of the environmental performance standards, the scope for a MAARNG's Area-wide EIR was issued in January 1999. The Draft Area-wide EIR was found adequate in October 1999. The Secretary stated in the July 2001 Certificate for the Final EIR that the CWG Master Plan would provide the foundation for ongoing and future planning efforts at the MMR.

The Final EIR identified the 3600 Area of Camp Edwards as the proposed location for the new UTES despite feasibility concerns regarding the location. In the intervening years since the issuance of the Certificate for the Final EIR, a further planning document titled the *Site Consolidation Plan* was developed and sited the new UTES within the general vicinity of the former BOMARC Missile Complex site. Additionally, due to changes in the military's global mission, the need for a Tactical Training Base (TTB) at Camp Edwards became of paramount importance, and the 3600 Area was developed into such. The TTB has left no space available for the new UTES at the 3600 Area.

In May 2007, the MAARNG proposed to construct a replacement UTES at the former BOMARC Missile Complex site. The proposed UTES would have been an approximately 55,000 ft<sup>2</sup>, single-story building with 11 work-bays and a Basic Issue Items storage area. The MAARNG initiated the NEPA compliance and Massachusetts Environmental Policy Act (MEPA) analysis process for this Proposed Action; however, funding delays prevented the proposed construction from occurring within the 3-year window allowable under the MEPA. As such, the MAARNG stopped the preparation of the associated EA.

**RTI.** Planning for the RTI component of the Proposed Action began in May 2007 when the MAARNG proposed to construct an approximately 39,000-ft<sup>2</sup>, three-story training building, two approximately 25,000-ft<sup>2</sup> barracks, and approximately 84,400 ft<sup>2</sup> of additional parking space for the RTI at the 5200 Area of Camp Edwards. Renovations to Buildings 5222 and 5232 were also included in the Proposed Action. Similar to the UTES project, the MAARNG initiated the NEPA compliance and MEPA analysis process for this Proposed Action; however, funding delays prevented the proposed construction from occurring within the 3-year window allowable under the MEPA. As such, the MAARNG stopped the preparation of the associated EA.

## **1.4.2 Interagency Coordination and Public Involvement**

NEPA ensures that environmental information is made available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if proponents provide information on their actions to state and local governments and the public and involve them in the planning process. The Intergovernmental Coordination Act and Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal.

The preparation of this EA is being coordinated with appropriate Federal, state, and local agencies. **Section 9** identifies all agencies and individuals contacted during the preparation of the EA. Agency input has been obtained during the first of two 30-day comment periods. During the initial comment period, all comments submitted by agencies, organizations, and individuals on the Proposed Action or Draft EA itself have been considered. Because this EA has concluded that there are no significant effects, this EA is expected to be finalized and a draft FNSI will be prepared. The Final EA and Draft FNSI will then be made available to the public during another 30-day period. Notices of comment periods and the availability of this EA for public review will be advertised in local newspapers. **Appendix C** of this EA will display copies of public notices, copies of agency coordination, and comments received to date.

### 1.4.3 Organization of this Document

This EA has been divided by sections to include all components required by the Environmental Analysis of Army Actions (32 CFR 651) and the *Army National Guard Manual for Compliance with the National Environmental Policy Act of 1969 (NEPA Handbook October 2011 edition)*. **Section 1** contains background information on the MMR and the Proposed Action, the purpose of and the need for the Proposed Action, a summary of applicable regulatory requirements, an outline of the scope of the EA, and an introduction to the organization of this EA. **Section 2** provides a detailed description of the Proposed Action and discusses alternatives to the Proposed Action that were considered, including the No Action Alternative, and identifies the Preferred Alternative. **Section 3** contains a general description of the biophysical resources and baseline conditions that could be affected by the Proposed Action and the No Action Alternative. **Section 4** presents an analysis of the potential environmental consequences and potential cumulative effects from the Proposed Action and No Action Alternative. **Section 5** provides a comparison of the effects from the alternatives and draws conclusions. **Section 6** lists the references used in the preparation of the document. **Section 7** defines the abbreviations and acronyms that are used throughout this document. **Section 8** lists the preparers of the document. **Section 9** includes information on the agencies and individuals consulted during the development of the EA.

**Appendix A** contains photographs showing the current conditions in the areas associated with the Proposed Action and alternatives. **Appendix B** includes examples of relevant laws, regulations, and other requirements that are often considered as part of the analysis. **Appendix C** includes a copy of the interested party letter and the distribution list and will include agency and public comments once they are received. **Appendix D** contains a copy of the air emission calculations used in this EA.

## 1.5 Relevant Plans, Laws, Regulations, and Other Documents

### 1.5.1 National Environmental Policy Act

NEPA (42 U.S.C. Section 4321–4347) is a Federal statute requiring the identification and analysis of potential environmental effects associated with proposed Federal actions before those actions are taken. The intent of NEPA is to help decisionmakers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. NEPA established the CEQ, which was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA.

The CEQ regulations mandate that all Federal agencies use a prescribed structured approach to environmental impact analysis. This approach also requires Federal agencies to use an interdisciplinary and systematic approach in their decisionmaking process. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action.

The process for implementing NEPA is outlined in 40 CFR, Parts 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. The CEQ was established under NEPA to implement and oversee Federal policy in this process. The CEQ regulations specify that an EA be prepared to provide evidence and analysis for determining whether to prepare a FNSI or whether the preparation of an EIS is necessary. This EA can aid in an agency's compliance with NEPA when an EIS is unnecessary and facilitate preparation of an EIS when one is required.

The U.S. Army's implementing regulation for NEPA is outlined in 32 CFR, Part 651, *Environmental Analysis of Army Actions*. Additionally, the *Army National Guard Manual for Compliance with the National Environmental Policy Act of 1969 (NEPA Handbook October 2011 edition)* outlines procedures for compliance with NEPA. Collectively, these regulations and guidance establish the process that the



Army National Guard uses to consider and document the potential environmental and socioeconomic effects of proposed actions and alternatives.

### **1.5.2 Massachusetts Environmental Policy Act**

The ownership of Camp Edwards by the Commonwealth of Massachusetts requires that Federal actions, such as the Proposed Action, are also evaluated under the provisions of the MEPA as defined under Massachusetts General Laws; Chapter 30, Sections 61 through 62H, inclusive.

The MEPA process calls for the filing of an Environmental Notification Form (ENF) with the Commonwealth of Massachusetts Secretary of Environmental Affairs (the Secretary) describing the Proposed Action. Based upon input received from interested state agencies, the Secretary will then determine whether or not an EIR is required. In cases where an existing proposal undergoes significant alteration, a Notice of Project Change is submitted that is subjected to the same review process as an ENF. In all instances, the outcome is determined by the issuance of a Certificate by the Secretary.

### **1.5.3 Integration of Other Environmental Statutes and Regulations**

To comply with NEPA, the planning and decisionmaking process for actions proposed by Federal agencies involves a study of relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or EIS, which enables the decisionmaker to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated “with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively” (40 CFR 1500.2a). **Appendix B** contains a summary of the additional environmental compliance requirements including the revised 2007 environmental performance standards that were originally developed as part of the 2001 *Final Area-wide Environmental Impact Report for the Massachusetts National Guard Properties at the Massachusetts Military Reservation*. These environmental performance standards were created to protect resources and to manage the activities of the Massachusetts National Guard at the MMR.

## 2. Description of the Proposed Action and Alternatives

### 2.1 Introduction

This section provides detailed information on the Proposed Action and alternatives considered. As stated in **Section 1**, under the Proposed Action, the MAARNG would construct and operate a replacement UTES with associated infrastructure and facilities and construct and operate two additional buildings for the Massachusetts RTI at Camp Edwards, Massachusetts. The UTES and RTI projects would be distinct components of this Proposed Action and would be completed on schedules independent from one another. As such, the **Section 2.2** breaks down and describes the Proposed Action by the two components.

### 2.2 Proposed Action

#### 2.2.1 UTES

The UTES component of the Proposed Action would entail the construction of a replacement UTES at the southwestern corner of the former BOMARC Missile Complex. **Figure 2-1** shows existing conditions at the former BOMARC Missile Complex, and **Figure 2-2** shows the proposed construction. The proposed UTES would be a single-story facility that would measure 49,044 ft<sup>2</sup> and would be constructed as a permanent masonry-type facility, with sloped standing seam roof, concrete floors, and energy-efficient mechanical and electrical equipment meeting the standards of Leadership in Energy Environmental Design (LEED) Silver. The facility would include eight vehicle work-bays, each measuring 1,024 ft<sup>2</sup>, and a central administration area. The central administration area would house offices, a fitness room, latrines, supply and tool storage areas, a classroom, a conference room, small arms areas, and utility areas. The proposed facility would comfortably provide for the needs of the 89 vehicles currently assigned to the existing facility.

The proposed UTES would be constructed approximately 1,200 feet to the west of the existing UTES (Building 4601) at the former BOMARC Missile Complex. The former BOMARC Missile Complex is an approximately 70-acre rectangular area approximately 1 mile to the north of the U.S. Coast Guard (USCG) Air Station Cape Cod runway complex and is accessible from Greenway Road. The Greenway residential neighborhood is immediately to the east and a vehicle wash-rack and the Camp Edwards fuel station are immediately to the west of the former BOMARC Missile Complex. The former BOMARC Missile Complex is considered part of the Cantonment Area of the MMR and outside of the Upper Cape Water Supply Reserve.

Most of the former BOMARC Missile Complex is flat and level. Several drainage swales are on the western portion of the former complex, and a storm water detention basin has been constructed toward the center. Two other storm water detention basins are near the southwest corner. Vegetation at the former complex consists of small trees and shrubs but is limited to the drainage swales and wooded areas surrounding the perimeter. Most of the area is covered with crushed stone, gravel, and pavement, and the complex is generally devoid of exposed topsoil. A number of groundwater monitoring wells have been installed as part of an ongoing clean-up effort to observe groundwater contamination that has resulted from former operations at the complex.

The proposed UTES area formerly contained a number of structures associated with the BOMARC missile launch system. Shelters for Type I and Type II Launchers were located at and adjoining the area for the proposed UTES. These structures were demolished between 2002 and 2006. Following their demolition, concrete and crushed stone surface was placed across much of the surface. Drainage swales are around the perimeter of the pavements to handle storm water.



Figure 2-1. Existing Conditions at the former BOMARC Missile Complex





Figure 2-2. Facility Layout for the UTES Construction

The proposed UTES would be constructed adjacent to the primary training site, wash-rack, and fuel station, and it would be in close proximity to the Camp Edwards training areas. All utilities including electric power, natural gas, communications, water, and sanitary sewer are already available to the area surrounding the proposed facility and would be extended to the facility. One diesel-fueled, approximately 300-kilowatt, emergency electrical generator would be installed to provide a backup supply of electrical power.

An approximately 14-acre storage lot would be constructed surrounding the proposed UTES for the storage of government-owned vehicles and equipment. This lot would include approximately 1.8-acres of concrete pavement with the remainder composed of flexible surface and crushed stone. A portion of the materials to be used for the flexible surface would consist of Reclaimed Asphalt Pavement (RAP) that would be generated as part of a supplemental environmental project to remove pavement associated with past infrastructure throughout the cantonment area. The RAP would be used in a variety of applications including as part of the flexible paving sub-base and binder aggregate and blended with the crushed stone in unpaved areas associated with the proposed UTES facility.

The storage lot would be secured with a fence extending around the perimeter, and necessary storm water-handling infrastructure would be included to transport storm water to the existing drainage swales. An asphalt-paved privately owned vehicle (POV) parking lot with the capacity for 70 automobiles would be constructed immediately to the west of the proposed UTES. The POV parking lot would be outside of the security fence and designed in accordance with anti-terrorism/force-protection (AT/FP) parking standoffs. Vehicle access to the proposed UTES would be from the south using Dolan Road. Secondary access roads from the west would provide direct access to the installation's training areas, wash-rack, and fuel station. Appropriate landscaping would be conducted following the construction of the proposed UTES and would include the construction of approximately 13,400 ft<sup>2</sup> of new sidewalks.

Following the construction of the proposed UTES, the existing UTES (Building 4601) would be demolished and an approximately 20,000-ft<sup>2</sup> controlled-humidity building would be constructed on the site of the former UTES building. Alterations to the parking area at the existing UTES would be made to accommodate the proposed controlled-humidity building.

In total, no more than 15 acres would be disturbed from the construction of the proposed UTES, demolition of the existing UTES, and the construction of the controlled-humidity building. Because the areas to be disturbed are already covered with pavement and crushed stone and because following construction the amount of concrete and crushed stone surface would be similar to current conditions, no net change in the amount of impervious and semi-impervious surface would be expected. Construction and demolition for the UTES component of the Proposed Action is anticipated to occur during Fiscal Year (FY) 2013. The MILCON project number for the UTES component of the Proposed Action is 250065.

## **2.2.2 RTI**

The RTI component of the Proposed Action would entail the construction of an education building and a barracks for the RTI. The proposed buildings would be sited in the 5200 Area of Camp Edwards, which is east of Turpentine Road and adjacent to the existing RTI buildings. **Figure 2-3** shows existing conditions at the 5200 Area, and **Figure 2-4** shows the proposed construction. The 5200 Area already contains several RTI facilities, including the existing RTI barracks (Building 5232) and the existing RTI administrative and classroom building (Building 5222). There are other barracks at the 5200 Area that are under the control of other agencies and occasionally are used by the RTI. A dining facility (Building 5220) is located within the 5200 Area to provide food service for personnel staying in the barracks.



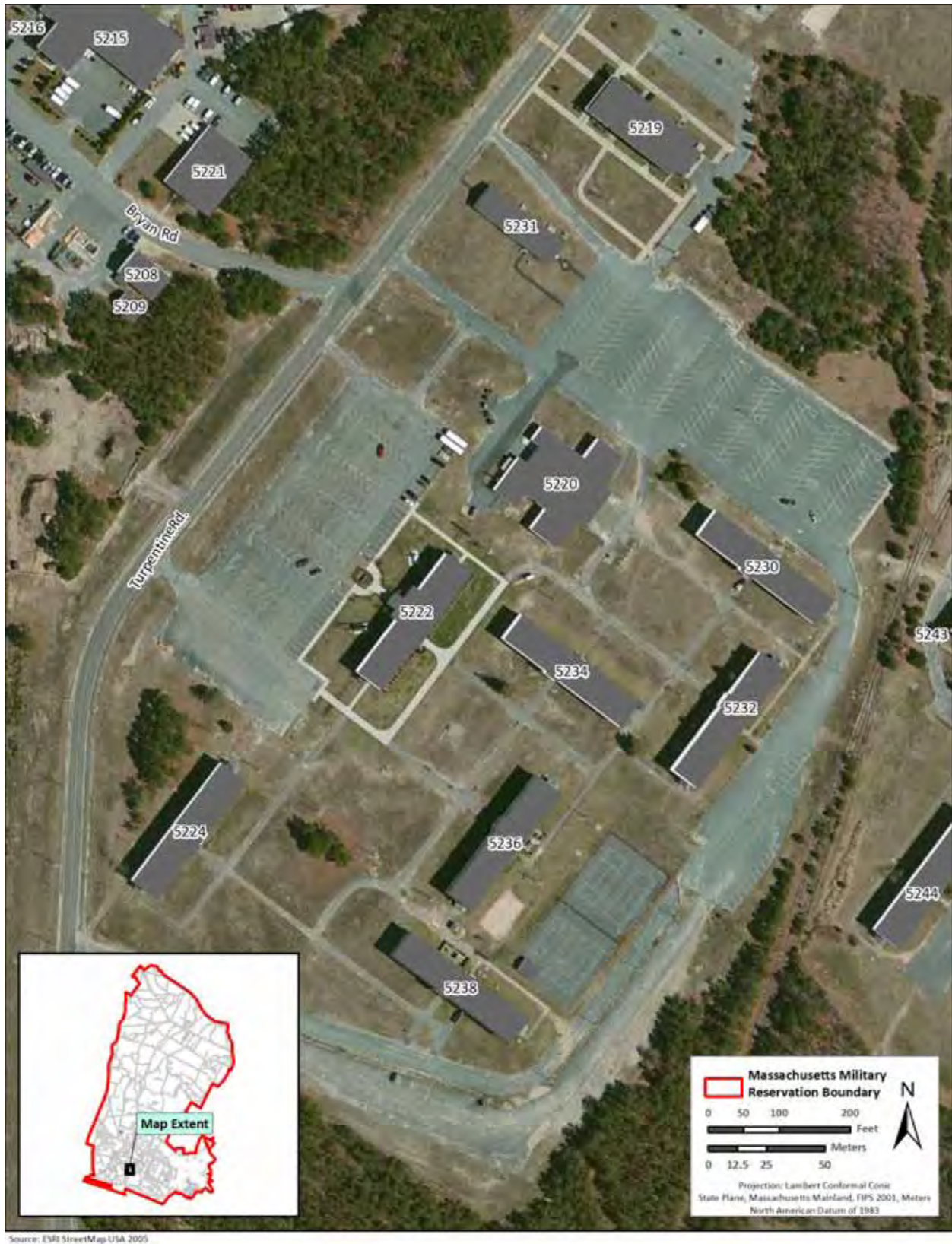


Figure 2-3. Existing conditions at the 5200 Area of Camp Edwards



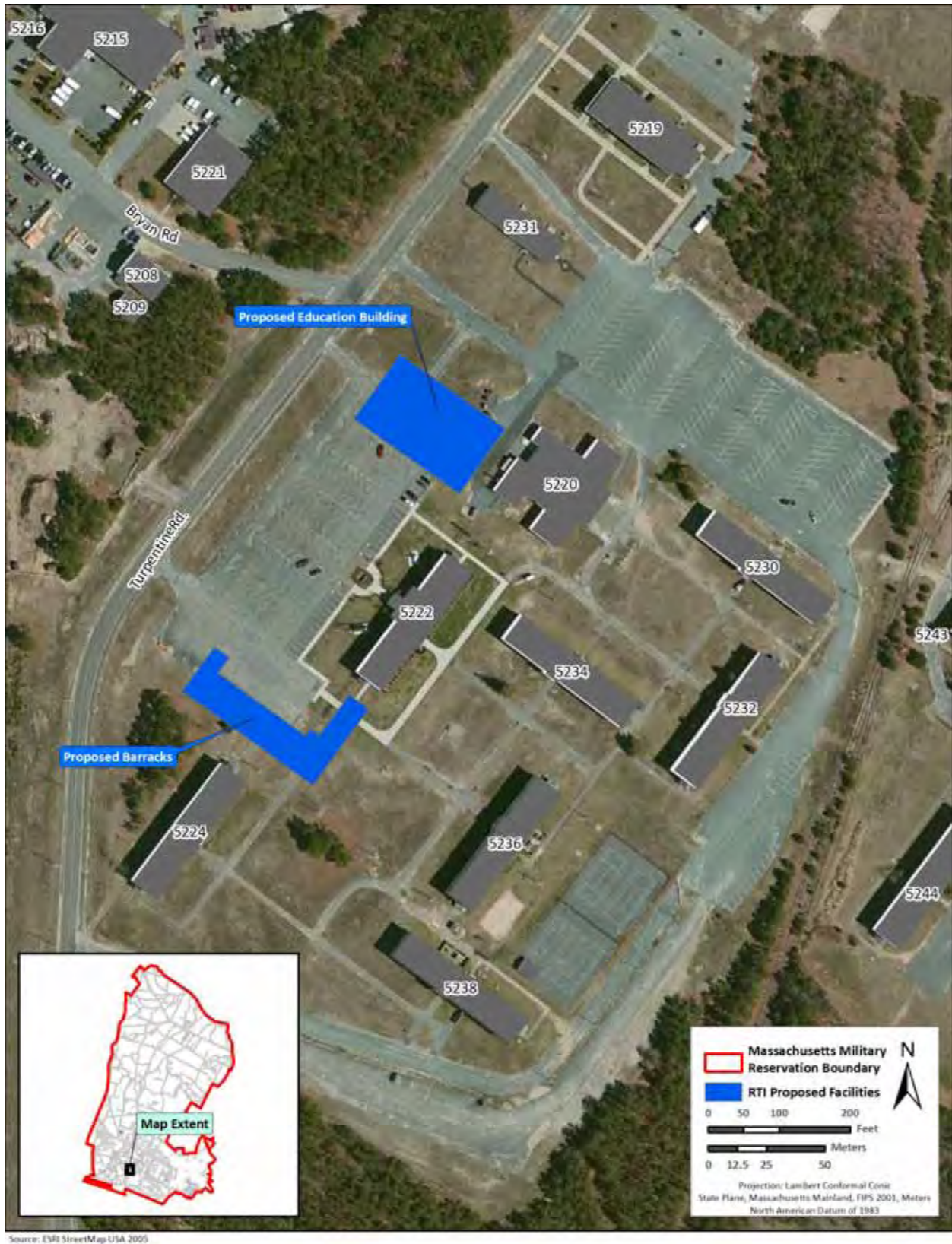


Figure 2-4. Facility Layout for the RTI Construction

The proposed education building would measure 25,913 ft<sup>2</sup> and would be constructed partially on the northern portion of the existing RTI parking area and partially on the grass area immediately to the north of the parking lot. The proposed facility would be positioned between the existing dining facility (Building 5220) and Turpentine Road and would be three stories in height. The proposed facility would include numerous classrooms, a break area, offices for staff, a teacher preparation area, and a physical fitness area. The proposed education building would provide a modern work and teaching environment for the RTI and would eliminate the design deficiencies currently experienced at Building 5222.

The proposed barracks would measure 32,125 ft<sup>2</sup> and would be constructed partially on the southern portion of the existing RTI parking area and partially on the grass area immediately to the south of the parking lot. The proposed facility would be positioned adjacent to Buildings 5222 and 5224. The proposed barracks would be three stories in height and include 47 rooms designed for double occupancy. Lounges would be on each floor, and the first floor would contain a mechanical room, laundry room, and an office. The barracks would be used for either enlisted or officer personnel, and it would provide modern housing that would eliminate the need for the RTI to use barracks that are under the control of other departments and agencies.

Both buildings proposed for construction would be concrete masonry structures with steel-gabled joists, steel perimeter beams, and corrugated metal decks. They would be very similar in appearance to the current structures of the 5200 Area. In addition, overall building footprints would be similar to existing buildings, and the proposed facilities would be situated in a manner that maintains the campus-like character of the 5200 Area. Both proposed buildings would achieve an energy-efficiency rating of LEED Silver and include all appropriate AT/FP measures. All utilities, including electric power, water, and sanitary sewer, are already available to the area surrounding the proposed facilities. Appropriate landscaping would be conducted following the construction of the proposed facilities and would include the construction of approximately 4,000 ft<sup>2</sup> of new sidewalks.

Under the current design, the construction of these buildings would require the existing RTI parking lot to be reconfigured in order to meet AT/FP parking standoff requirements. Approximately 1,350 ft<sup>2</sup> of new concrete paving and 300 linear feet of new curbs would be constructed to reconfigure the parking area. RAP would also be used, as appropriate, in paving applications. However, the reconfiguration of the parking lot would still result in the removal of 30 car parking spaces and 7 bus parking spaces. The loss of these parking spaces would leave 142 car spaces and no bus parking spaces at the RTI campus. Construction for the RTI component of the Proposed Action is anticipated to occur during FY 2014. The MILCON project number for the RTI component of the Proposed Action is 250095.

## **2.3 Alternatives Considered**

According to guidance provided by NEPA, the Environmental Analysis of Army Actions (32 CFR 651), and the *Army National Guard Manual for Compliance with the National Environmental Policy Act of 1969 (NEPA Handbook October 2011 edition)*, an EA or an EIS must identify and evaluate reasonable alternatives to a proposed action. The alternatives are to provide a basis from which to compare the Proposed Action with other potential methods of implementation.

### **2.3.1 Alternative Development (Screening Criteria)**

The MAARNG has developed screening criteria to aid in the identification of alternative sites for the UTES and RTI components of the Proposed Action. These criteria are summarized as follows:

- The proposed UTES should be close to the training area of Camp Edwards to minimize traffic, fuel consumption, and the use of existing paved roads by tracked vehicles. While tracked

vehicles are not currently assigned to Camp Edwards, their future use is possible, and these vehicles can have deleterious effects on pavement.

- The proposed UTES should be in close proximity to existing utility services (e.g., water, sewer, and electric), the vehicle wash-rack, the fuel station, existing parking areas, and roads leading to the training area.
- The location of the proposed UTES should support the maintenance and issuance of military vehicles and equipment to units that train at Camp Edwards.
- The proposed UTES should be large enough to provide sufficient equipment storage space, adequate and efficient maintenance areas, and administrative space for personnel assigned to Camp Edwards.
- The proposed UTES should be able to accommodate one work-bay for every three mechanics assigned to Camp Edwards. It should be designed to allow vehicles to drive through each work-bay. It should be large enough to enable maintenance on each vehicle type to be conducted with the doors closed.
- The proposed RTI buildings should be in an area of Camp Edwards appropriately zoned for classroom training and barracks.
- The proposed RTI buildings should be in close proximity to the existing RTI facilities (e.g., Buildings 5232 and 5222).
- The proposed RTI buildings should be in close proximity to existing utility services (e.g., water, sewer, and electric) and existing parking areas and be easily accessible by current roads.
- The proposed RTI site should be large enough to provide a sufficient area to incorporate the additional classroom, administrative space, and barracks required.
- The proposed UTES and RTI buildings should be developed in such a way that the natural and cultural resources of Camp Edwards are not affected to the maximum extent possible.
- The proposed UTES and RTI buildings should be constructed at locations that minimize the amount of demolition and do not interfere with existing installation operations.

### **2.3.2 Evaluated Alternatives**

This section describes reasonable alternatives that passed the screening criteria and have been retained for further analysis in the EA. This section also describes the No Action Alternative and the Preferred Alternative.

#### **No Action Alternative**

The No Action Alternative refers to a continuation of existing conditions without implementation of the Proposed Action. The No Action Alternative is required by CEQ regulations and serves as a benchmark against which the Proposed Action and other alternatives can be evaluated.

Under the No Action Alternative, a replacement UTES and additional buildings for the RTI would not be constructed and the existing facilities would remain in operation. No construction, demolition, or ground disturbance would occur. If this alternative is chosen, then the difficulties and inefficiencies identified in **Sections 1.2.2 and 1.2.3** would not be alleviated. The MAARNG would continue to operate in substandard, inappropriately-equipped facilities that would impact on troop morale and effect equipment and ultimately soldier mission readiness. While the No Action Alternative does not satisfy the purpose of

or need for the Proposed Action, it will be analyzed in detail in this EA in accordance with CEQ regulations.

### **The Preferred Alternative**

The Preferred Alternative is the Proposed Action as described in **Section 2.2**. The proposed UTES would be constructed at the southwestern corner of the BOMARC site in the vicinity of the existing UTES. The proposed RTI buildings would be constructed at the 5200 Area of the installation in the vicinity of the existing RTI buildings.

### **2.3.3 Alternatives Considered but Eliminated from Further Detailed Analysis**

This section identifies and briefly describes alternatives that were considered but not carried forward for detailed analysis because they were not found to be reasonable.

#### **Alternative Layouts of the UTES at the former BOMARC Missile Complex**

Three alternative layouts for the UTES and associated POV parking areas were considered at the former BOMARC Missile Complex. Of these alternative layouts, one was considered the secondary alternative to the preferred layout, as presented in **Section 2.2**, and the remaining two were considered other alternatives. Each alternative layout would disturb no more than 15 acres at the former BOMARC Missile Complex and each would entail similar construction and demolition actions as the preferred layout. Due to the proximity of each alternative layout to the preferred layout and the largely similar site conditions at each, the environmental effects from these alternative layouts are expected to be the same as the environmental effects from the preferred layout. Therefore, these alternative layouts for the UTES are not carried forward for separate further detailed evaluation in this EA. **Figure 2-5** shows the alternative layouts for the UTES at the former BOMARC Missile Complex.

#### **Locate UTES in the 3600 Area**

As noted in **Section 1.5.1**, the 3600 Area of the installation was proposed as the location for the UTES in the Final EIR. In the intervening years since the issuance of the Certificate for the Final EIR, the 3600 Area was developed into a TTB to meet global military mission requirements. There is no longer sufficient space at the 3600 Area to support the UTES; therefore, this alternative is no longer a viable option and is eliminated from further detailed analysis in this EA. **Figure 2-6** shows the location of the 3600 Area.

#### **Locate UTES in the 2800 Area**

The 2800 Area of the installation contains aviation, maintenance, and administrative facilities. This area includes the helicopter (aviation) hangar, the Facilities Engineering building, and Field Maintenance Shop #9. Some of these facilities provide vehicle maintenance, which could be relocated to the UTES following building construction.

The remainder of the 2800 Area is open space and adequately meets the space criteria for the Proposed Action. However, the area is also grassland and has been designated as critical habitat for four state-listed bird species. In addition, the 2800 Area is approximately 2.5 miles from the training areas, fuel station, and wash-rack facilities. Therefore, the 2800 Area fails to meet several of the established criteria, and is eliminated from further detailed analysis in this EA. **Figure 2-6** shows the location of the 2800 Area.



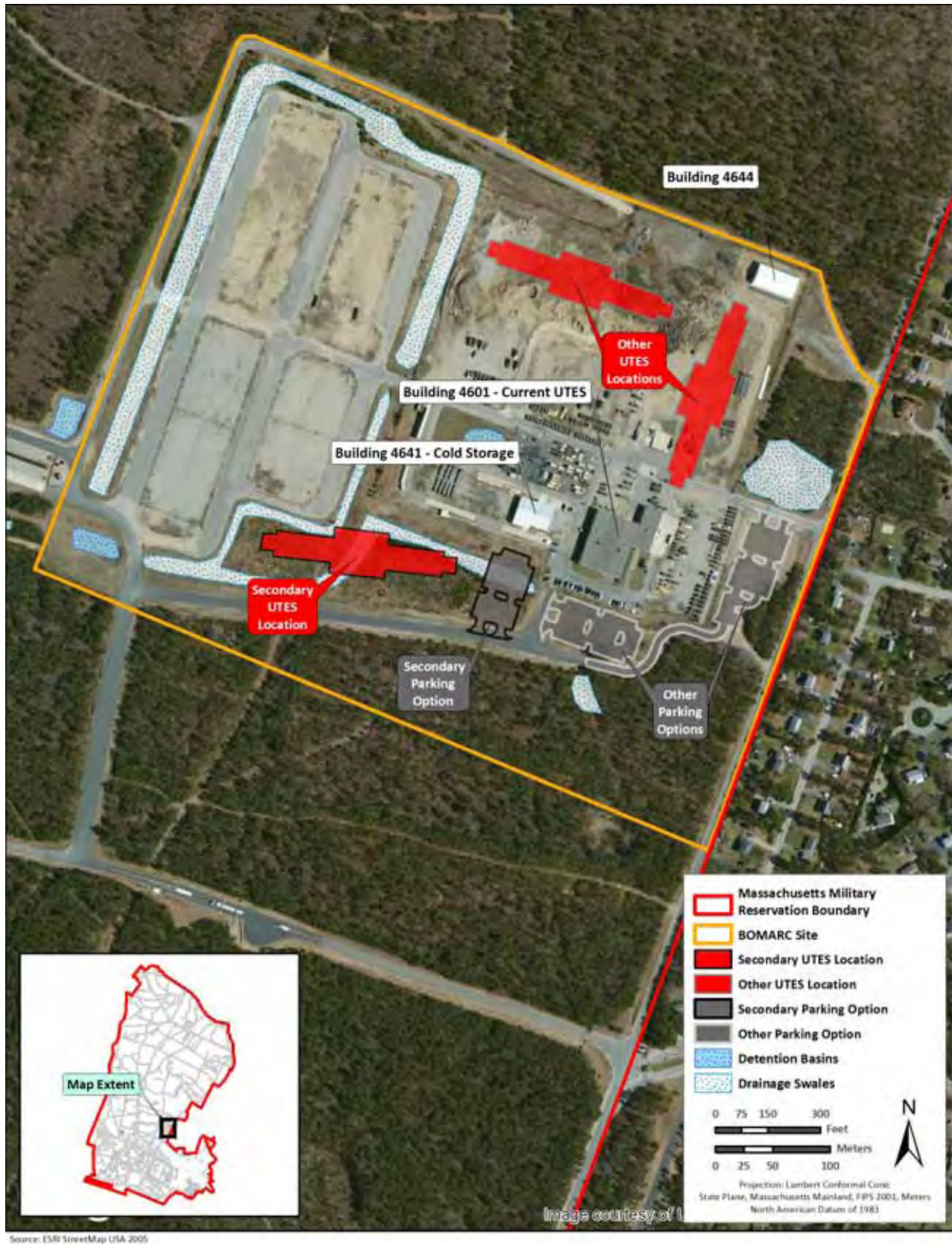


Figure 2-5. Alternative Layouts for the UTES at the former BOMARC Missile Complex



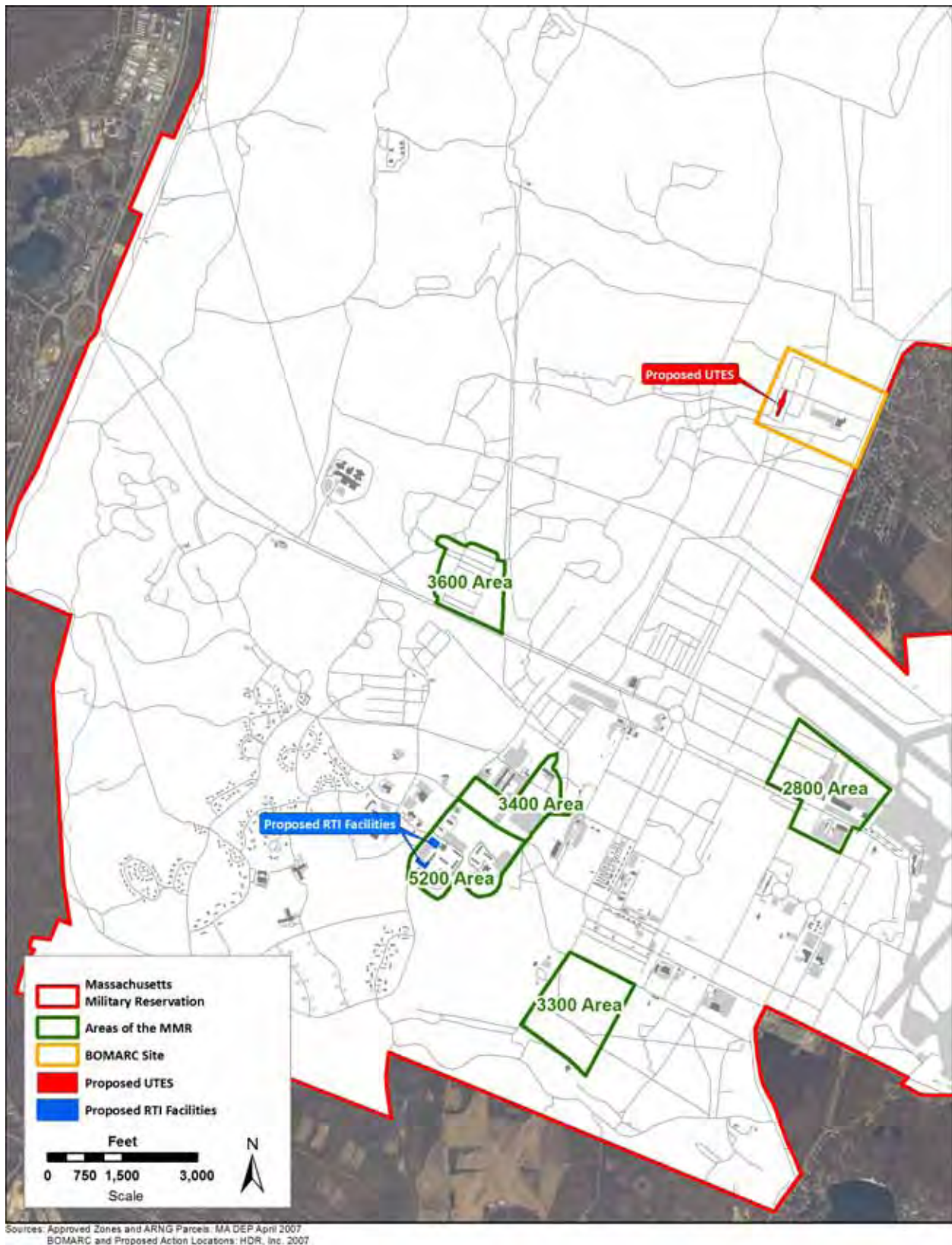


Figure 2-6. Alternative Locations for the Proposed Action

### **Locate UTES in the 3300 Area**

The 3300 Area is a recreation field area and is adjacent to the MMR Golf Course. Although there is adequate space, it is the farthest site from the training areas, fuel station, and wash-rack facilities. Locating the UTES site at the 3300 Area would also disturb areas of pitch pine and grassland. Therefore, the 3300 Area fails to meet several of the established criteria, and is eliminated from further detailed analysis in this EA. **Figure 2-6** shows the location of the 3300 Area.

### **Locate RTI in the 3400 Area**

The 3400 Area of the installation is to the north of the 5200 Area and has been partially cleared from the demolition of an old barracks complex. The area is adjacent to the existing RTI and associated barracks and construction there would not result in effects on natural or cultural resources. The Site Consolidation Plan for Camp Edwards has, however, identified this area for the future consolidation of the Camp Edwards Headquarters, field classrooms, indoor qualifications range, supply warehouse, and other training and support facilities. This would allow commanders, trainers, and trainees to coordinate closely while moving through the training preparations and tasks (MAARNG 2005a). The 5200 and 3400 Areas are zoned as training areas on the MMR. However, due to space constraints, the 3400 Area was eliminated from further consideration. **Figure 2-6** shows the location of the 3400 Area.

### 3. Affected Environment

This section describes the environmental resources and conditions most likely to be affected by the Proposed Action and provides information to serve as a baseline from which to identify and evaluate potential environmental and socioeconomic effects that could result from the Proposed Action. Baseline conditions represent current conditions. The potential environmental effects potentially associated with the Proposed Action and the No Action Alternative are described in **Section 4**. In compliance with NEPA and CEQ guidelines, the description of the affected environment focuses on those resources and conditions potentially subject to effects.

#### 3.1 Land Use

##### 3.1.1 Definition of the Resource

The term “land use” refers to real property classifications that indicate either natural conditions or the types of human activity occurring within a specified area. In many cases, land use descriptions are codified in local zoning laws. However, there is no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, “labels,” and definitions vary among jurisdictions. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. Descriptive terms for land use categories resulting from human activity often used include residential, commercial, industrial, agricultural, institutional, and recreational. Army installation land use planning commonly uses 12 general land use classifications (i.e., airfields, maintenance, industrial, supply/storage, administration, training/ranges, unaccompanied personnel housing, family housing, community facilities, medical, outdoor recreation, and open space) (ARNG 2011).

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. Tools supporting land use planning include written master plans/management plans and zoning regulations. In the civilian sector, land use plans guide the type and extent of allowable land use in an effort to control and limit growth; maintain and improve social, cultural, and physical amenities; promote a stable economy; preserve agricultural lands; maintain scenic areas; supply adequate housing; ensure the availability of necessary public services and utilities; and protect specially designated or environmentally sensitive areas. Army installation land use planning is focused on providing facilities (i.e., training installations) that support an overall quality environment for military forces needed to maintain national security (ARNG 2011).

The location and extent of a proposed action needs to be evaluated for its potential effects on a project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include property ownership, existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its “permanence.”

##### 3.1.2 Existing Conditions

**Installation Land Use.** Approximately 18,000 acres of the 21,000-acre MMR are owned by the Commonwealth of Massachusetts and leased to the Federal government, of which most is licensed back to the Commonwealth for military training purposes (CCC 1998).

The MMR is divided into three general land use areas: the Airfield Area, Cantonment Area, and Training Area (CCC 1998). The Airfield Area is in the southeastern portion of the MMR. It primarily consists of

USCG Air Station Cape Cod and the Otis Air National Guard (ANG) Base, and is occupied by the USCG, ANG, and Federal Aviation Administration (MAARNG 2009d). There are two runways with related facilities such as aprons, taxiways, aviation maintenance facilities, and other non-aviation uses in the Airfield Area. The Cantonment Area is directly west of the Airfield Area in the southern and southwestern portion of the MMR. It consists of the installation's main complex of offices, classrooms, laboratories, industrial uses, and housing. Most of the work, training, and industrial uses (e.g., offices, classrooms, shops, and maintenance facilities) are in the eastern and central portions of the Cantonment Area, while the western portion is primarily used for residential, recreational, and other community support uses such as schools, community center, and medical facilities. The Training Area encompasses the northern 75 percent of the MMR and is primarily occupied by Camp Edwards, which is a training site for MAARNG. This area includes maneuvering and patrol training areas; small arms ranges; helicopter landing zones; nuclear, biological, and chemical training bunkers; and an extensive road network used for convoy and driver training (Massachusetts National Guard 2011).

Based on existing and future planned uses at the MMR, the *MMR Master Plan Final Report* ("CWG Master Plan") designated three land use/management zones to facilitate long-term planning and land management at the MMR (CCC 1998). As discussed in **Section 1.5.1**, the CWG Master Plan indicates that future military and civilian development should occur in the 5,000-acre Cantonment Area zone in the southern portion of the MMR, while the northern 15,000 acres of MMR, which is the Natural Resources/Water Supply zone, would be reserved as open land for water supply, wildlife habitat, open space, and compatible military uses. In 2002, the Natural Resources/Water Supply zone was designated the Upper Cape Water Supply Reserve by Massachusetts law (Chapter 47 of the Acts of 2002) to ensure the permanent protection of the drinking water supply and wildlife habitats (DOD OEA 2005). A third management zone (the Grassland Management/Over Cantonment zone) includes and surrounds the airfield and is designed to protect existing grassland habitats for rare species (CCC 1998). The proposed facilities in the UTES and RTI components of the Proposed Action are within the Cantonment Area land use and management zone and, thus, are outside of the Natural Resources/Water Supply zone (Groundwater Protection Zone) and Upper Cape Water Supply Reserve (CCC 1998, MAARNG 2003).

The *Camp Edwards Site Consolidation Plan* ("Site Consolidation Plan"), prepared in 2005, supplements the CWG Master Plan and identifies Camp Edwards-specific long-term goals and objectives within a broad coordinated land use planning framework (MAARNG 2005a). The CWG Master Plan recommended that military uses be consolidated into distinct areas in order to achieve greater operational efficiency and to preserve other land for future generations. Therefore, the Site Consolidation Plan categorized MAARNG properties at the MMR, including Camp Edwards, into Military Land Use Districts (MLDs). By arranging MAARNG military activities into defined MLDs, MAARNG facilitates and improves training conditions by locating resources in proper locations. The MLDs prevent land use conflicts that would negatively affect training efficiency (MAARNG 2005a). The Site Consolidation Plan divides Camp Edwards into the following MLDs: Mission Training – Open, Mission Training – Structures, Mission Support, Heavy Equipment, Administration, Airfield, Housing, Family Support, Community, and Environmental Management.

The existing UTES, proposed UTES, and proposed controlled-humidity building are within the Heavy Equipment MLD. The Heavy Equipment MLD is designated for land intensively used for training and mission support. Under the RTI component of the Proposed Action, the proposed education building is within the Mission Training (Structures) MLD, and the proposed barracks is within the Mission Training (Structures) and Housing MLDs (MAARNG 2005a). The Mission Training (Structures) MLD is designated for land that is committed to training exercises where permanent structures are needed to support the exercises. The Housing MLD is for billeting. The Site Consolidation Plan identifies several key improvements, which include recommendations for UTES and RTI facilities. The plan states that the outdated UTES should be replaced with an environmentally sound facility outside water supply recharge

area. The plan's suggested location for the UTES is in the same area where it currently is proposed; however, this location is within a Zone II water supply area (see **Section 3.5.2**). The Site Consolidation Plan's recommendation regarding the RTI includes making improvements to the RTI as part of a broader effort to create a meeting center with campus-like setting within the 5200 Area. The plan identifies that the suggested RTI improvements should occur at the same locations as are proposed in this EA (MAARNG 2005a).

There are no known institutional land use controls at the project sites for the UTES and RTI components of the Proposed Action (USAEC 2011).

**Surrounding Land Use.** The MMR is situated in parts of the towns of Bourne, Mashpee, Sandwich, and Falmouth in the western portion of Barnstable County, Massachusetts, on Cape Cod. The installation is bounded by U.S. Highway 6 to the north, State Highway 130 and the Forestdale area of the town of Sandwich to the east, the Frances A. Crane Wildlife Management Area to the south, and State Highway 28 to the west.

Almost half of the MMR, including the proposed sites for the UTES, controlled-humidity building, RTI education building, and RTI barracks, is within the corporate limits of the town of Sandwich. The proposed project sites for the UTES and RTI components of the Proposed Action are within area zoned as Government District, which is designated for land within the MMR and other public lands and governmental functions (Town of Sandwich 2011a). The town of Sandwich has also designated these areas as within the Water Resources Protection Overlay District (Town of Sandwich 2011a). The purpose of overlaying this district is to protect the town's groundwater resources in order to ensure a safe and healthy public water supply through development limitations that preserve existing development patterns (Town of Sandwich 2009). Although Camp Edwards is not subject to the requirements of local zoning ordinances, the MAARNG aggressively seeks to protect groundwater resources through the implementation of appropriate best management practices (BMPs).

The former BOMARC missile site, which is the location of the proposed UTES and controlled-humidity building, is on the southeastern boundary of Camp Edwards, directly adjacent to the residential Forestdale area of the town of Sandwich. This neighborhood is designated as the R-2 Residential zoning district, which is a low-density residential environment in areas of good accessibility that protects air quality, surface water, and groundwater (Town of Sandwich 2009, Town of Sandwich 2011b). The proposed controlled-humidity building is approximately 550 feet from the Forestdale residential area, and the proposed UTES is approximately 1,750 feet from this neighborhood.

The proposed RTI education building and barracks are within the interior of the MMR, approximately 0.75 miles from off-installation land.

## **3.2 Air Quality**

### **3.2.1 Definition of the Resource**

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of criteria pollutants in the atmosphere. The air quality in a region is a result of not only the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

**Ambient Air Quality Standards.** Under the CAA, the U.S. Environmental Protection Agency (USEPA) developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to affect human health and the environment. The NAAQS represent the maximum allowable concentrations for ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM<sub>10</sub>] and particulate matter equal to or less than 2.5 microns in diameter [PM<sub>2.5</sub>]), and lead (Pb) (40 CFR Part 50). The CAA also gives the authority to states to establish air quality rules and regulations. The Commonwealth of Massachusetts has adopted the NAAQS and promulgated additional State Ambient Air Quality Standards (SAAQS) for criteria pollutants. In some cases, the SAAQS are more stringent than the Federal primary standards. **Table 3-1** presents the NAAQS and SAAQS.

**Attainment Versus Nonattainment and General Conformity.** The USEPA classifies the air quality in an air quality control region (AQCR), or in subareas of an AQCR, according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. Areas within each AQCR are therefore designated as either “attainment,” “nonattainment,” “maintenance,” or “unclassified” for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is better than the NAAQS; nonattainment indicates that criteria pollutant levels exceed NAAQS; maintenance indicates that an area was previously designated nonattainment but is now attainment; and an unclassified air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR, so the area is considered attainment. USEPA has delegated the authority for ensuring compliance with the NAAQS in Massachusetts to the Massachusetts Department of Environmental Protection (MassDEP). In accordance with the CAA, each state must develop a State Implementation Plan (SIP), which is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS.

The General Conformity Rule applies only to significant actions in nonattainment or maintenance areas. This rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

**Federal Prevention of Significant Deterioration.** Federal Prevention of Significant Deterioration (PSD) regulations apply in attainment areas to a major stationary source, (i.e., source with the potential to emit 250 tons per year [tpy] of any criteria pollutant), and a significant modification to a PSD major stationary source, (i.e., change that adds 15 to 40 tpy to the facility’s potential to emit depending on the pollutant). Additional PSD major source and significant modification thresholds apply for greenhouse gases (GHGs), as discussed in the Greenhouse Gas Emissions subsection. PSD permitting can also apply to a proposed project if all three of the following conditions exist: (1) the proposed project is a modification with a net emissions increase to an existing PSD major source, and (2) the proposed project is within 10 kilometers of national parks or wilderness areas (i.e., Class I Areas), and (3) regulated stationary source pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 milligram per cubic meter (mg/m<sup>3</sup>) or more (40 CFR 52.21[b][23][iii]). A Class I area includes national parks larger than 6,000 acres, national wilderness areas and national memorial parks larger than 5,000 acres, and international parks. PSD regulations also define ambient air increments, limiting the allowable increases to any area’s baseline air contaminant concentrations, based on the area’s Class designation (40 CFR 52.21[c]).

**Table 3-1. National and State Ambient Air Quality Standards, Effective October 2011**

Pollutant	Averaging Time	Primary Standard		Secondary Standard
		Federal	State	
CO	8-hour <sup>(1)</sup>	9 ppm (10 mg/m <sup>3</sup> )	Same as Federal	None
	1-hour <sup>(1)</sup>	35 ppm (40 mg/m <sup>3</sup> )	Same as Federal	None
Pb	Rolling 3-Month Average <sup>(2)</sup>	0.15 µg/m <sup>3</sup> <sup>(3)</sup>	Same as Federal	Same as Primary
NO <sub>2</sub>	Annual <sup>(4)</sup>	53 ppb <sup>(5)</sup>	50 ppb	Same as Primary
	1-hour <sup>(6)</sup>	100 ppb	--	None
PM <sub>10</sub>	24-hour <sup>(7)</sup>	150 µg/m <sup>3</sup>	Same as Federal	Same as Primary
	Annual (Arithmetic Mean)	--	50 µg/m <sup>3</sup>	Same as Primary
PM <sub>2.5</sub>	Annual <sup>(8)</sup>	15 µg/m <sup>3</sup>	--	Same as Primary
	24-hour <sup>(6)</sup>	35 µg/m <sup>3</sup>	--	Same as Primary
O <sub>3</sub>	8-hour <sup>(9)</sup>	0.075 ppm <sup>(10)</sup>	Same as Federal	Same as Primary
SO <sub>2</sub>	1-hour <sup>(11)</sup>	75 ppb <sup>(12)</sup>	--	None
	Annual (Arithmetic Mean)	--	0.03 ppm	None
	24-hour	--	0.14 ppm	None
	3-hour <sup>(1)</sup>	--	--	0.5 ppm

Sources: USEPA 2011a, Commonwealth of Massachusetts undated

Notes: Parenthetical values are approximate equivalent concentrations.

1. Not to be exceeded more than once per year.
2. Not to be exceeded.
3. Final rule signed 15 October 2008. The 1978 lead standard (1.5 µg/m<sup>3</sup> as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
4. Annual Mean.
5. The official level of the annual NO<sub>2</sub> standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of cleaner comparison to the 1-hour standard.
6. 98th percentile, averaged over 3 years.
7. Not to be exceeded more than once per year on average over 3 years.
8. Annual mean, averaged over 3 years.
9. Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
10. Final rule signed 12 March 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, USEPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.
11. 99<sup>th</sup> percentile of 1-hour daily maximum concentrations, averaged over 3 years.
12. Final rule signed 2 June 2010. The 1971 annual (0.3 ppm) and 24-hour (0.14 ppm) SO<sub>2</sub> standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

Key: ppm = parts per million; ppb = parts per billion; mg/m<sup>3</sup> = milligrams per cubic meter; µg/m<sup>3</sup> = micrograms per cubic meter

**Title V Requirements.** Title V of the CAA Amendments of 1990 requires states and local agencies to permit major stationary sources. A Title V major stationary source has the potential to emit criteria air pollutants and hazardous air pollutants (HAPs) at levels equal to or greater than Major Source Thresholds. Major Source Thresholds vary depending on the attainment status of an AQCR. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and monitor their effect on air quality. Section 112 of the CAA lists HAPs and identifies source categories.

**Greenhouse Gas Emissions.** GHGs are gaseous emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO<sub>2</sub>), methane, and nitrous oxide. GHGs are primarily produced by the burning of fossil fuels and through industrial and biological processes. On 22 September 2009, the USEPA issued a final rule for mandatory GHG reporting from large GHG emissions sources in the United States. The purpose of the rule is to collect comprehensive and accurate data on CO<sub>2</sub> and other GHG emissions that can be used to inform future policy decisions. In general, the threshold for reporting is 25,000 metric tons or more of CO<sub>2</sub> equivalent emissions per year but excludes mobile source emissions. GHG emissions will also be factors in PSD and Title V permitting and reporting, according to a USEPA rulemaking issued on 3 June 2010 (75 Federal Register 31514). GHG emissions thresholds of significance for permitting of stationary sources are 75,000 tons CO<sub>2</sub> equivalent per year and 100,000 tons CO<sub>2</sub> equivalent per year under these permit programs.

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, was signed in October 2009 and requires agencies to set goals for reducing GHG emissions. One requirement within EO 13514 is the development and implementation of an agency Strategic Sustainability Performance Plan (SSPP) that prioritizes agency actions based on lifecycle return on investment. Each SSPP is required to identify, among other things, “agency activities, policies, plans, procedures, and practices” and “specific agency goals, a schedule, milestones, and approaches for achieving results, and quantifiable metrics” relevant to the implementation of EO 13514. On 26 August 2010, Department of Defense (DOD) released its SSPP to the public. This implementation plan describes specific actions the DOD will take to achieve its individual GHG reduction targets, reduce long-term costs, and meet the full range of goals of the EO. All SSPPs segregate GHG emissions into three categories: Scope 1, Scope 2, and Scope 3 emissions. Scope 1 GHG emissions are those directly occurring from sources that are owned or controlled by the agency. Scope 2 emissions are indirect emissions generated in the production of electricity, heat, or steam purchased by the agency. Scope 3 emissions are other indirect GHG emissions that result from agency activities but from sources that are not owned or directly controlled by the agency. The GHG goals in the DOD SSPP include reducing Scope 1 and Scope 2 GHG emissions by 34 percent by 2020, relative to FY 2008 emissions, and reducing Scope 3 GHG emissions by 13.5 percent by 2020, relative to FY 2008 emissions.

### **3.2.2 Existing Conditions**

The MMR is located in Barnstable County, Massachusetts, which is within the Metropolitan Providence Interstate (MPI) AQCR 120. The MPI AQCR includes all of Rhode Island and southeastern Massachusetts (USEPA 2002a). Barnstable County has been designated as unclassified/attainment for all criteria pollutants except 8-hour O<sub>3</sub>. O<sub>3</sub> is classified as moderate nonattainment (USEPA 2011b, USEPA 2002b). According to 40 CFR Part 81, no Class I areas are located within 10 kilometers of the MMR (USEPA 2012).

The most recent emissions for Barnstable County and the counties of the MPI AQCR are shown in **Table 3-2**. Barnstable County is considered the local area of influence, and the MPI AQCR is considered the regional area of influence for this air quality analysis. O<sub>3</sub> is not a direct emission; it is generated from



**Table 3-2. Local and Regional Air Emissions Inventory for the Proposed Action (2008)**

Location	NO <sub>x</sub> (tpy)	VOC (tpy)	CO (tpy)	SO <sub>2</sub> (tpy)	PM <sub>10</sub> (tpy)	PM <sub>2.5</sub> (tpy)
Barnstable County	6,769	10,521	59,043	5,656	11,470	1,913
MPI AQCR	67,883	85,406	507,429	50,161	75,451	13,630

Source: USEPA 2008

reactions of volatile organic compounds (VOCs) and nitrogen oxides (NO<sub>x</sub>), which are precursors to O<sub>3</sub>. Therefore, for the purposes of this air quality analysis, VOCs and NO<sub>x</sub> emissions are used to represent O<sub>3</sub> generation.

Potential air emissions from stationary sources at Camp Edwards are below the established Federal and Commonwealth thresholds for the designated primary air pollutants (CO, NO<sub>x</sub>, particulate matter, SO<sub>2</sub>, VOCs). As such, Camp Edwards does not need an air quality control operating permit for stationary source emissions under the provisions of the CAA (MAARNG 2010a).

Massachusetts protection of air quality regulations are provided in 310 Commonwealth of Massachusetts Regulation (CMR) 7.00 through 7.71. These regulations require that any person having control of a fuel-burning facility or facilities with a total rated input capacity in excess of 10,000,000 British thermal units per hour of natural gas or fuel oil register certain information with MassDEP and submit required reports to it. Because of the number of fuel-burning facilities on Camp Edwards, the MAARNG is required to submit a Source Registration/Emissions Statement report for Camp Edwards to MassDEP every 3 years or as otherwise required by MassDEP. The last report for Camp Edwards was submitted in May 2009 for calendar year 2008, and the next report will be submitted in calendar year 2012 with calendar year 2011 information (MAARNG 2010a).

### 3.3 Noise

#### 3.3.1 Definition of the Resource

Sound is defined as a particular auditory effect produced by a given source, for example the sound of rain on a rooftop. Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory effect. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. How an individual responds to the sound source will determine if the sound is viewed as music to one's ears or as annoying noise. Affected receptors are specific (e.g., schools, churches, or hospitals) or broad (e.g., nature preserves or designated districts) areas in which occasional or persistent sensitivity to noise above ambient levels exists.

**Noise Metrics and Regulations.** Although human response to noise varies, measurements can be calculated with instruments that record instantaneous sound levels in decibels. A-weighted decibel (dBA) is used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency range to what the average human ear can sense when experiencing an audible event. The threshold of audibility is generally within the range of 10 to 25 dBA for normal hearing. The threshold of pain occurs at the upper boundary of audibility, which is normally in the region of 135 dBA.

**Table 3-3** compares common sounds and shows how they rank in terms of the effects of hearing. As shown, a whisper is normally 30 dBA and considered to be very quiet while an air conditioning unit 20 feet away is considered an intrusive noise at 60 dBA. Noise levels can become annoying at 80 dBA and very annoying at 90 dBA. To the human ear, each 10 dBA increase seems twice as loud (USEPA 1981).

**Table 3-3. Sound Levels and Human Response**

Noise Level (dBA)	Common Sounds	Effect
10	Just audible	Negligible*
30	Soft whisper (15 feet)	Very quiet
50	Light auto traffic (100 feet)	Quiet
60	Air conditioning unit (20 feet)	Intrusive
70	Noisy restaurant or freeway traffic	Telephone use difficult
80	Alarm clock (2 feet)	Annoying
90	Heavy truck (50 feet) or city traffic	Very annoying Hearing damage (8 hours)
100	Garbage truck	Very annoying*
110	Pile drivers	Strained vocal effort*
120	Jet takeoff (200 feet) or auto horn (3 feet)	Maximum vocal effort
140	Carrier deck jet operation	Painfully loud

Source: USEPA 1981

Note: \*HDR interpolation

**Federal Regulations.** Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over an 8-hour period. The highest allowable sound level to which workers can be constantly exposed to is 115 dBA and exposure to this level must not exceed 15 minutes within an 8-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

Sound levels, resulting from multiple single events, are used to characterize noise effects from aircraft or vehicle activity and are measured in Day-Night Average Sound Level (DNL). The DNL noise metric incorporates a “penalty” for nighttime noise events to account for increased annoyance. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10-dBA penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging sound exposure levels over a given 24-hour period. DNL is the designated noise metric of the Federal Aviation Administration (FAA), U.S. Department of Housing and Urban Development (HUD), USEPA, and DOD for modeling airport environments.

According to the U.S. Air Force, the FAA, and the HUD criteria, residential units and other noise-sensitive land uses are “clearly unacceptable” in areas where the noise exposure exceeds 75 dBA DNL, “normally unacceptable” in regions exposed to noise between 65 and 75 dBA DNL, and “normally acceptable” in areas exposed to noise of 65 dBA DNL or under. The Federal Interagency Committee on Noise developed land use compatibility guidelines for noise in terms of a DNL sound level

(FICON 1992). For outdoor activities, the USEPA recommends 55 dBA DNL as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise (USEPA 1974).

**State Regulations.** The MassDEP has established a Noise Level Policy for implementing the Noise Control Regulation defined in 310 CMR 7.10. The policy specifies that a new noise source proposed in an area that is not likely to be developed for residential use because of development constraints, or proposed in a commercial or industrial area with no sensitive receptors might not be required to mitigate its noise impact. The regulation states that even if the projected noise levels at the facility's property line exceed the ambient background by more than 10 dBA, mitigation might not be required. However, a new noise source proposed in an area with current or proposed noise-sensitive receptors could be required to mitigate its noise impact in these areas (MassDEP undated a).

**Construction Sound Levels.** Building demolition and construction work can cause an increase in sound that is well above the ambient level. A variety of sounds are emitted from loaders, trucks, pavers, and other work equipment. **Table 3-4** lists noise levels associated with common types of construction equipment. Construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.

**Table 3-4. Predicted Noise Levels for Construction Equipment**

<b>Construction Equipment</b>	<b>Predicted Noise Level at 50 feet (dBA)</b>
Backhoe	72–93
Concrete mixer	74–88
Crane	75–87
Front loader	72–83
Grader	80–93
Jackhammer	81–98
Paver	86–88
Pile driver	95–105
Roller	73–75
Truck	83–94

Source: USEPA 1971

### 3.3.2 Existing Conditions

The ambient noise environment around the MMR is affected mainly by small arms training, helicopter and aircraft activity originating from the Otis ANG Base, and automobile traffic. In 2007, a Statewide Operational Noise Management Plan was completed that included noise management strategies for Camp Edwards and the other MAARNG facilities. The report included a description of noise environments and noise levels from small arms and aircraft training activities (MAARNG 2011a). The noise contours at Otis ANG Base are shown in the 2005 Joint Land Use Study. The UTES and RTI sites are within the 65 to 75 dBA DNL noise contours (DOD OEA 2005).

The site of the UTES component of the Proposed Action is the former BOMARC Missile Complex. The area around this site is mostly vegetated; the town of Forestdale is approximately 1,800 feet to the east of the proposed UTES building and 500 feet to the east of the proposed controlled-humidity building. There

are small arms ranges along Greenway Road, approximately 0.5 miles to the northeast of the proposed UTES site (MAARNG 2007a). Vehicle traffic can cause an increase to the noise environment that might affect populations adjacent to major roadways. Major roadways adjacent to the proposed UTES and controlled-humidity building include Dolan, Greenway, and Snake Pond roads. However, traffic on these roadways is light and is assumed to produce negligible noise levels.

The site of the RTI component of the Proposed Action is about 0.75 miles from the MMR installation boundary and directly adjacent to existing barracks. Major roadways adjacent to the proposed RTI include Turpentine and Lee roads and Curtis Boulevard. Traffic on these roadways is light and is assumed to produce negligible noise levels.

### 3.4 Earth Resources (Geology, Topography, and Soils)

#### 3.4.1 Definition of the Resource

**Geology.** Geology is the study of the Earth's composition and provides information on the structure of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition.

**Topography.** Topography refers to the general shape and arrangement of a land surface, including its elevation and the position of both natural and artificial features.

**Soils.** Soils are the unconsolidated materials overlying bedrock or other parent materials. Soils are usually described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink swell potential, and erosion potential affect their abilities to support certain uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

**Prime Farmland.** Prime farmland is protected under the Farmland Protection Policy Act (FPPA) of 1981. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land or water. The intent of the FPPA is to minimize the extent that Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses.

**Geologic Hazards.** Geologic hazards are defined as a natural geologic event that can endanger human lives and property. Examples include earthquakes, landslides, rock falls, ground subsidence, and avalanches.

#### 3.4.2 Existing Conditions

**Geology.** The geology of Camp Edwards and its environs is composed primarily of Pleistocene Age sandstones, with sandstone deposits of Holocene age present along major drainage channels overlying Proterozoic-age schist, gneiss, and granite bedrock (MAARNG 2009e).

Surficial glacial sediments deposited during the retreat of the Wisconsin glaciation underlie western Cape Cod. These deposits are estimated to be approximately 15,000 years old. In the Camp Edwards region, there are three large sedimentary units: the Buzzards Bay Moraine, the Sandwich Moraine, and the Mashpee Pitted Plain. The Buzzards Bay and Sandwich Moraines are mounds or ridges of unstratified glacial till along the western and northern edges of the installation, respectively. Both are composed of

ablation till, unsorted material ranging from clay to boulders and deposited at the leading edge of Wisconsin glaciations.

Fine- to coarse-grained sands compose the Mashpee Pitted Plain, which forms the outwash plain between the two moraines. Underlying this formation are fine-grained, glacial-lake sediments and basal till (MAARNG 2009e). The sites for both the proposed UTES and RTI facilities are within the Mashpee Pitted Plain formation (Army and USAF 2004).

**Physiography and Topography.** Camp Edwards is within the Atlantic Coastal Plain physiographic province. Elevations on Camp Edwards range from 250 feet above mean sea level (MSL) at the northern end of the installation to 50 feet above MSL at its southern end (USACE 2000). The former BOMARC Missile Complex, site of the proposed UTES facility, is mostly flat and level, as is the 5200 Area of Camp Edwards, which is the site of the proposed RTI facilities (Army and USAF 2004).

**Soils.** Soils present in the vicinity of the Proposed Action sites include the Merrimac sandy loam, with slopes of 0 to 8 percent; Enfield silt loam, with slopes of 0 to 3 percent; Hinckley gravelly sandy loam, with slopes of 8 to 15 percent and Udipsamments (NRCS 2011).

At the UTES site, surface soils are predominantly Urban land, which underlie the sites of both the proposed UTES and the proposed controlled-humidity building (NRCS 2011). The site is mostly devoid of topsoil and is covered mainly with crushed stone, gravel, and pavement. The soil underlying these sites is well-drained and has a low frequency of flooding and ponding. Soils underlying the UTES site have been contaminated by past releases of hazardous substances. Further information on environmental contamination at the UTES site is provided in **Section 3.10.2** (MAARNG 2011b).

At the RTI site, the primary soil mapped is the Merrimac-Udipsamments-Urban land complex, a complex of sandy loam and sandy fill heavily altered by human activity with slopes of 0 to 8 percent. This complex is somewhat excessively drained, and has a low frequency of flooding and ponding. Other soils present on site include Hinckley gravelly sandy loam and Udipsamments.

**Prime Farmland.** No prime farmland soils have been mapped at Camp Edwards (MAARNG 2009e).

**Geologic Hazards.** Camp Edwards is at minimal risk for earthquakes because Massachusetts lies on a passive continental margin with a stable transition between continental and oceanic crust. The U.S. Geological Survey (USGS) produced seismic hazard maps based on current information about the frequency and intensity of earthquakes. The maps show the levels of horizontal shaking that have a 2 in 100 chance of being exceeded in a 50-year period. Shaking is expressed as a percentage of the force of gravity (percent g) and is proportional to the hazard faced by a particular type of building. In general, little or no damage is expected at values less than 10 percent g, moderate damage could occur at 10 to 20 percent g, and major damage could occur at values greater than 20 percent g. The 2008 National Seismic Hazard map produced by the USGS shows that Camp Edwards has a seismic hazard rating of approximately 8 percent g (USGS 2012), making the risk of damage from seismic activity minimal.

**Radon.** Radon is a naturally occurring radioactive gas found in soils and rocks. It comes from the natural breakdown or decay of uranium. Radon has a tendency to accumulate in enclosed spaces that are usually below ground and poorly ventilated (e.g., basements). Radon is an odorless, colorless gas that has been determined to increase the risk of developing lung cancer. In general, the risk of lung cancer increases as the level of radon and length of exposure increase.

The USEPA has established a guidance radon level of 4 picocuries per liter (pCi/L) in indoor air for residences; however, standards have not been established for commercial structures. Radon gas accumulation greater than 4 pCi/L is considered to represent a health risk to occupants.

Camp Edwards and its environs are in the USEPA's Zone 2 for Radon potential. This means that the area has a predicted average indoor radon screening level between 2 and 4 pCi/L, or a moderate potential for elevated levels of indoor radon (USEPA 2011c).

## 3.5 Water Resources

### 3.5.1 Definition of the Resource

Water resources are natural and man-made sources of water that are available for use by and for the benefit of humans and the environment. Water resources relevant to Camp Edwards's location in Massachusetts include groundwater, surface water, floodplains, and wetlands. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes. Hydrology concerns the distribution of water to water resources through the processes of evapotranspiration, atmospheric transport, precipitation, surface runoff and flow, and subsurface flow. Hydrology results primarily from temperature and total precipitation that determine evapotranspiration rates, topography that determines rate and direction of surface flow, and soil and geologic properties that determine rate of subsurface flow and recharge to the groundwater reservoir.

**Groundwater.** Groundwater is water that exists in the saturated zone beneath the Earth's surface in pore spaces and fractures and includes aquifers. Groundwater is recharged through percolation of water on the ground's surface (e.g., precipitation and surface water bodies) and upward movement of water in lower aquifers through capillary movement. Groundwater is an essential resource that can be used for drinking, irrigation, and industrial processes. Groundwater typically can be described in terms of depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations. The interface between the groundwater potentiometric surface (i.e., depth to groundwater below ground surface) and surface topography often results in streams, rivers, and lakes.

Groundwater quality and quantity are regulated under several programs. The Federal Underground Injection Control regulations, authorized under the Safe Drinking Water Act (SDWA), require a permit for the discharge or disposal of fluids into a well. The Federal Sole Source Aquifer regulations, also authorized under the SDWA, protect aquifers that are critical to water supply.

**Surface Water.** Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contribution to the economic, ecological, recreational, and human health of a community or locale. Waters of the United States are defined within the Clean Water Act (CWA), as amended, and jurisdiction is addressed by the USEPA and the USACE. These agencies assert jurisdiction over (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) nonnavigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months), and (4) wetlands that directly abut such tributaries. Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredge or fill into waters of the United States including wetlands. Encroachment into waters of the United States and wetlands requires permits from the state and the Federal government. Wetland hydrology is briefly discussed within this section. **Section 3.6** provides a discussion of wetland habitat occurring within the action areas and adjacent wetlands that might be affected by the actions being considered.

Per Section 401 of the CWA, any applicant for a Federal license or permit to conduct any activity including the construction or operation of facilities, which could result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the state in which the discharge originates or will originate. The Section 401 program is administered by the MassDEP. In making certification decisions, MassDEP is primarily concerned with the size of the impact and the type of resource being impacted. The evaluation criteria for these certifications are designed to avoid wetlands impacts and to minimize and mitigate any unavoidable impacts. For projects with minor impacts, an Order of Conditions serves as a Water Quality Certification, and no application for certification is necessary. For larger impacts, or discharges to Outstanding Resource Waters or other sensitive resources, proponents are required to submit an application to MassDEP for a Water Quality Certification review (MassDEP 2008).

A water body can be deemed impaired if water quality analyses conclude that exceedances of the water quality standards established by the CWA occur. The CWA requires that states establish a Section 303(d) list to identify impaired waters and establish Total Maximum Daily Loads (TMDLs) for the source(s) causing the impairment. A TMDL is the maximum amount of a substance that can be assimilated by a water body without causing impairment. The CWA also mandated the National Pollutant Discharge Elimination System program, which regulates the discharge of point (end of pipe) and nonpoint (storm water) sources of water pollution and requires a permit for any discharge of pollutants into waters of the United States.

Storm water (water from precipitation events) is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade surface waters. Proper storm water flow management, which can be intensified by high proportions of impervious surfaces associated with buildings, roads, and parking lots, is important to the management of surface water quality and natural flow characteristics. Prolonged increases in storm water volume and velocity associated with development and increased impervious surfaces has potential to impact adjacent streams as a result of streambank erosion and channel widening or down cutting associated with the adjustment of the stream to the change in flow characteristics. Storm water management systems are typically designed to contain runoff on site during construction, and to maintain predevelopment storm water flow characteristics following development through either the application of infiltration or retention practices. Failure to size storm water systems appropriately to hold or delay conveyance of the largest predicted precipitation event often leads to downstream flooding and the environmental and economic damages associated with flooding.

The USEPA published the technology-based Final Effluent Limitations Guidelines (ELGs) and New Performance Standards for the Construction and Development Point Source Category on 1 December 2009 to control the discharge of pollutants from construction sites. The Rule became effective on 1 February 2010. After this date, all USEPA- or state-issued permits were to be revised to incorporate and address the ELG requirements. The USEPA currently regulates large and small (but greater than 1 acre) construction activities through the 2012 Construction General Permit (CGP). Permittees must select, install, and maintain effective erosion- and sedimentation-control BMPs as identified in the 2012 CGP, including the following:

- Sediment controls (e.g., sediment basins, sediment traps, silt fences, vegetative buffer strips)
- Offsite sediment tracking and dust control
- Runoff management
- Post-construction storm water management
- Erosion control and stabilization
- Spill/release prevention.

Construction activities, such as clearing, grading, trenching, and excavating, disturb soils and sediment. If not managed properly, disturbed soils and sediments can easily be washed into nearby water bodies during storm events, where water quality is reduced. Section 438 of the Energy Independence and Security Act (EISA) (42 U.S.C. 17094) establishes into law new storm water design requirements for Federal construction projects that disturb a footprint of greater than 5,000 ft<sup>2</sup> of land. EISA Section 438 requirements are independent of storm water requirements under the CWA. The project footprint consists of all horizontal hard surface and disturbed areas associated with project development. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Predevelopment hydrology shall be modeled or calculated using recognized tools and must include site-specific factors such as soil type, ground cover, and ground slope. Site design shall incorporate storm water retention and reuse technologies such as bioretention areas, permeable pavements, cisterns/recycling, and green roofs to the maximum extent technically feasible. Post-construction analyses would be conducted to evaluate the effectiveness of the as-built storm water reduction features (DOD 2010a). These regulations have been incorporated into applicable DOD Unified Facilities Criteria in April 2010, which stated that low-impact development (LID) features would need to be incorporated into new construction activities to comply with the restrictions on storm water management promulgated by EISA Section 438. LID is a storm water management strategy designed to maintain site hydrology and mitigate the adverse impacts of storm water runoff and nonpoint source pollution. LIDs can manage the increase in runoff between pre- and post-development conditions on the project site through interception, infiltration, storage, or evapotranspiration processes before the runoff is conveyed to receiving waters. Examples of the methods include bioretention, permeable pavements, cisterns/recycling, and green roofs (DOD 2010b). Additional guidance is provided in the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (USEPA 2009).

**Floodplains.** Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters. The living and nonliving parts of natural floodplains interact with each other to create dynamic systems in which each component helps to maintain the characteristics of the environment that support it. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, nutrient cycling, water quality maintenance, and diversification of plants and animals. Floodplains provide a broad area to spread out and temporarily store floodwaters. This reduces flood peaks and velocities and the potential for erosion. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body.

Floodplains are subject to periodic or infrequent inundation due to rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events, the size of the watershed above the floodplain, and upstream development. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain as an area within which there is a 1 percent chance of inundation by a flood event in a given year. Certain facilities inherently pose too great a risk to be in either the 100- or 500-year floodplain, such as hospitals, schools, or storage buildings for irreplaceable records. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

EO 11988, *Floodplain Management*, requires Federal agencies to determine whether a proposed action would occur within a floodplain. This determination typically involves consultation of FEMA Flood Insurance Rate Maps, which contain enough general information to determine the relationship of the project area to nearby floodplains. EO 11988 directs Federal agencies to avoid floodplains to the maximum extent possible wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize



the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities” for the following actions:

- Acquiring, managing, and disposing of Federal lands and facilities
- Providing federally undertaken, financed, or assisted construction and improvements
- Conducting Federal activities and programs affecting land use, including water and related land resources planning, regulation, and licensing activities.

### 3.5.2 Existing Conditions

**Groundwater.** The predominant source of groundwater in the Camp Edwards area is the Sagamore lens of the Cape Cod aquifer, a sole-source aquifer. It is a single, unconfined aquifer underlain by low permeability crystalline bedrock. Although the Sagamore lens is the predominant source of groundwater, it is not very productive. Groundwater flows north to the Cape Cod Canal or Cape Cod Bay, east to the Bass River, south and southeast to Nantucket Sound, and west and southwest towards Buzzards Bay (MAARNG 2009e). The Sagamore lens is designated by the USEPA as a Sole Source Aquifer under the Safe Drinking Water Act (MAARNG 2011b). Additionally, the Camp Edwards Training Site is also known as the Upper Cape Water Supply Reserve, and provides up to 3 million gallons of clean drinking water daily to Camp Edwards and the towns of Sandwich, Bourne, Falmouth, and Mashpee (MAARNG 2009a).

Groundwater flow direction from Camp Edwards is predominantly to the northwest and the hydraulic gradient steepens with distance from the top of the regional potentiometric groundwater mound. The water table is encountered at an average depth of 45 to 50 feet below ground surface in and around Camp Edwards, and the observed hydraulic travel time through the vadose zone is approximately 3 to 6 months. The width of the saturated zone varies between 180 to 280 feet (MAARNG 2009e).

Groundwater underlying the UTES site has been contaminated by past releases of hazardous substances. Further information on environmental contamination at the UTES site is provided in **Section 3.10.2** (MAARNG 2011b).

Groundwater at Camp Edwards was classified as GW-1 and GW-3, in accordance with the Massachusetts Contingency Plan (310 CMR 40.0932). Groundwater classified as GW-1 is water that might contribute to a Current Drinking Water Source Area or a Potential Drinking Water Source Area, while water classified GW-3 are groundwater resources that are considered a potential source of discharge to surface waters. In addition, portions of Camp Edwards, including the proposed locations for the UTES and RTI, lie within a Zone II area. According to 310 CMR 40.0006, Zone II is defined as the area of an aquifer that contributes water to a well under severe pumping and recharge conditions, as approved by MassDEP’s Division of Water Supply pursuant to 310 CMR 22.00. Groundwater at Camp Edwards might contribute to a Current Drinking Water Source Area or a Potential Drinking Water Source Area, and, therefore, is classified as category GW-1 (MAARNG 2011b). As with other commercial and industrial activities located within Zone II areas, the MAARNG employs all appropriate BMPs to ensure protection of Drinking Water Source Areas.

**Surface Water.** Surface water is scarce at Camp Edwards. The excessively drained, sandy soils are not conducive to surface water retention. Approximately 45 percent of the annual rainfall on the installation infiltrates the soil and contributes to groundwater (MAARNG 2009a). No large lakes or streams exist on the property; only small palustrine wetlands, ponds, and drainage swales and detention basins are at the UTES site. For a more detailed discussion of the wetland resources present at Camp Edwards, refer to

**Section 3.6.** These wetlands are well-vegetated, nontidal wetlands dominated by trees, shrubs, or emergent plants and have salinity below 0.5 parts per thousand (MAARNG 2009a)

Regional surface drainage radiates outward from the central portion of Camp Edwards. The surface drainage around Deep Bottom Pond, Cranberry Bog, and Monument Swamp is east to northeast with no discernible stream or creek channels leading to the Cape Cod Canal, west of Camp Edwards. Drainage in the area surrounding Raccoon Swamp is northwest towards Shawme Lake, northeast of the installation, and ultimately, Cape Cod Bay, north of the installation (MAARNG 2009e).

The closest surface water body to the UTES site is Weeks Pond, approximately 2,000 feet east of the site, outside of the Camp Edwards boundary. Weeks Pond ultimately discharges to Falmouth Harbor, and according to the Massachusetts Surface Water Quality Standards (314 CMR 4.06), is designated as a Class B surface water. Class B surface waters are designated as a habitat for fish, other aquatic life, and wildlife. Where designated in the 314 CMR 4.06, they shall be suitable as a source of public water with appropriate treatment. Class B waters are deemed suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses, and must have consistently good aesthetic value. The closest surface water bodies to the RTI site are Edmunds Pond and Osborne Pond (MAARNG 2001).

**Floodplains.** FEMA Flood Insurance Rate Map Index Panel Nos. 255210IND0 and 250012IND0 for Barnstable County, Massachusetts, indicate that areas within Camp Edwards are in either Zone X or Zone D. Zone X lies outside the 500-year floodplain, and Zone D includes areas in which flood hazards are undetermined. Both the UTES and RTI sites are located in Zone X (MAARNG 2009e).

## 3.6 Biological Resources

### 3.6.1 Definition of the Resource

Biological resources include native or naturalized plants and animals and the habitats (e.g., forests and grasslands) in which they exist. For the purposes of assessing potential environmental effects, biological resources typically are addressed as vegetation (e.g., forests and grasslands), wildlife (e.g., birds and mammals), threatened and endangered species, and wetlands. Federal and Commonwealth of Massachusetts regulations protect these resources, and a description of key regulations is provided as follows.

**Migratory Bird Treaty Act.** The Migratory Bird Treaty Act (MBTA) provides the U.S. Fish and Wildlife Service (USFWS) regulatory authority to protect birds that migrate. The MBTA prohibits any "take" of these species, except as permitted by the USFWS.

**Endangered Species Act.** The Endangered Species Act (ESA) requires that all Federal agencies shall seek to conserve threatened and endangered species and shall utilize their authorities in furtherance of the purposes of the ESA (Section 2(c)). Under the ESA (16 U.S.C. 1536), an "endangered species" is defined as any species in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined as any species likely to become endangered in the foreseeable future. The USFWS also maintains a list of species considered to be candidates for possible listing under the ESA. Although "candidate species" receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and might warrant protection under the ESA. Under Section 7 of the ESA, consultations with the USFWS would be conducted to ensure that "any action authorized, funded, or carried out by such an agency...is not likely to jeopardize the continued existence of any endangered or threatened species..." (Section 7(a)(2)).

**Massachusetts Endangered Species Act.** Federally listed species are protected under the ESA, while Commonwealth of Massachusetts listed rare species are protected under the Massachusetts Endangered Species Act (MESA) (Massachusetts General Law c. 131A) and its implementing regulations (321 CMR 10.00). MESA prevents a loss or take of state-listed rare species.

**Clean Water Act.** Wetlands are protected as a subset of the “waters of the United States” under Section 404 of the CWA. Section 404 of the CWA authorizes the Secretary of the Army, acting through the U.S. Army Corps of Engineers (USACE), Chief of Engineers, to issue permits for the discharge of dredged or fill materials into the waters of the United States, including wetlands.

**Wetlands.** The USACE defines wetlands as “those areas that are inundated or saturated with ground or surface water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated conditions. Wetlands generally include swamps, marshes, bogs, and similar areas” (33 CFR Part 329). Wetlands perform several hydrologic functions, including water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, storm water attenuation and storage, sediment detention, and erosion protection. Wetlands are protected as a subset of the waters of the United States under Section 404 of the CWA. The term “waters of the United States” has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats (including wetlands).

EO 11990, *Protection of Wetlands*, (24 May 1977) directs agencies to consider alternatives to avoid adverse effects and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland and the proposed construction incorporates all possible measures to limit harm to the wetland. Agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands. In accordance with EO 11990 and 32 CFR Part 989, a Finding of No Practicable Alternative must accompany the FNSI stating why there are no practicable alternatives to development within or affecting wetland areas.

The Massachusetts Wetland Protection Act protects against loss or destruction of wetlands. Any activities that are potentially destructive to surface water resources at Camp Edwards are prohibited within the wetland habitats and their 100-foot buffers (Massachusetts General Law c. 131 § 40, 310 CMR 10).

### 3.6.2 Existing Conditions

The DOD and the MAARNG manage natural resources through an ecosystems approach that emphasizes the maintenance and integrity of native biodiversity. Camp Edwards implemented an Integrated Natural Resources Management Plan (MAARNG 2009a), to establish goals and priorities for the conservation and preservation of natural resources, in compliance with applicable statutes and regulations, and the successful completion of military mission operations. The core of ecosystems management is the maintenance and integration of all floral and faunal communities, including the accommodation of human activities.

**Vegetation.** The site of the UTES component of the Proposed Action is characterized as “developed.” Most of the area is covered with crushed stone, gravel, and pavement, and the complex is generally devoid of exposed topsoil. The area for the proposed UTES building formerly contained a number of structures associated with the BOMARC missile launch system. These structures were demolished between 2002 and 2006 and impervious and semi-impervious surface was placed across much of the surface. The area surrounding the UTES component of the Proposed Action consists mainly of grasses

with scattered pitch pine (*Pinus rigida*), scrub oak (*Quercus ilicifolia*), and Northern white cedar (*Thuja occidentalis*). Adjacent habitats are approximately 50 to 100 meters from the proposed facility and consist mainly of immature pitch pine and pitch pine-scrub oak communities (MAARNG 2001).

The site of the RTI component of the Proposed Action was disturbed during the development of the 5200 Area. It consists of approximately half pavement for a parking lot and half manicured grass. The surrounding area consists mainly of both native and nonnative grasses and shrubs.

**Wildlife.** Wildlife management falls under the jurisdiction of the Massachusetts Division of Fisheries and Wildlife (MADFW) and the USFWS for migratory birds and federally listed threatened and endangered species. Threatened and endangered species are addressed below. Other laws protecting wildlife include, but are not limited to, the MBTA and the ESA.

Wildlife commonly observed in the area of the UTES component of the Proposed Action include common species such as raccoons (*Procyon lotor*), white-tailed deer (*Odocoileus virginiana*), and grey squirrels (*Sciurus carolinensis*). Pitch pine-scrub oak communities characterize the areas surrounding the UTES component of the Proposed Action. Bird species commonly observed in pitch pine-scrub oak community types include eastern towhee (*Pipilo erythrophthalmus*), field sparrow (*Spizella pusilla*), song sparrow (*Melospiza melodia*), prairie warbler (*Dendroica discolor*), whip-poor-will (*Caprimulgus vociferus*), and gray catbird (*Dumetella carolinensis*).

Because of its disturbed nature, there is little wildlife currently inhabiting the site of the RTI component of the Proposed Action. Wildlife species at the RTI site are representative of the species diversity commonly found at developed areas of Camp Edwards, including the UTES site.

**State-Listed Rare Species.** Thirty state-listed (i.e., endangered, threatened, and special concern) fauna species (see **Table 3-5**) and five state-listed flora species (see **Table 3-6**) have been observed on Camp Edwards. Along with the state-listed species, there is one candidate for Federal listing, the New England cottontail (*Sylvilagus transitionalis*) that occurs on Camp Edwards. As it is not yet federally listed, no regulatory actions are required. The Natural Heritage & Endangered Species Program (NHESP), part of the MADFW is responsible for the conservation and protection of vertebrate and invertebrate animals, and native plants that are officially listed as endangered, threatened or of special concern in Massachusetts.

There are no state- or federally listed plant species known to reside on the sites of the UTES and RTI components of the Proposed Action. There is no endangered species habitat on the sites of the UTES and RTI components of the Proposed Action.

**Wetlands.** There are no wetlands or waters of the United States on the site of the UTES component of the Proposed Action. The wetlands and waters of the United States in the vicinity of the UTES component of the Proposed Action include the UTES Pond and Washrack Wetland (see **Figure 3-1**). Each of these palustrine emergent wetlands is approximately 0.2 acres in area. According to the Massachusetts NHESP, the UTES Pond and Washrack Wetland are classified as shrub swamps. Neither of these has been certified as vernal pools by NHESP (MAARNG 2009a). There are also drainage ditches to the southwest and northeast of the proposed UTES building. There are no wetlands or waters of the United States on or adjoining the site of the RTI component of the Proposed Action (see **Figure 3-1**).

**Table 3-5. State-listed Fauna Species Observed on Camp Edwards**

Scientific Name	Common Name	MESA Status	ESA Status
<b>Birds</b>			
<i>Accipiter striatus</i>	Sharp-shinned hawk	SC	
<i>Ammodramus savannarum</i>	Grasshopper sparrow	T	
<i>Bartramia longicauda</i>	Upland sandpiper	E	
<i>Circus cyaneus</i>	Northern harrier	T	
<i>Parula americana</i>	Northern parula	T	
<i>Pooecetes gramineus</i>	Vesper sparrow	T	
<b>Reptiles and Amphibians</b>			
<i>Scaphiopus holbrookii</i>	Eastern spadefoot	T	
<i>Terrapene carolina carolina</i>	Eastern box turtle	SC	
<b>Odonates</b>			
<i>Anax longipes</i>	Comet darner	SC	
<i>Aesha mutata</i>	Spatterdock darner	E	
<i>Enallagma carunculatum</i>	Tule bluet	SC	
<i>Enallagma laterale</i>	New England bluet	SC	
<i>Enallagma recurvatum</i>	Pine Barrens bluet	T	
<b>Moths</b>			
<i>Abagrotis nefascia</i>	Coastal heathland cutworm	SC	
<i>Acronicta albarufa</i>	Barrens daggermoth	T	
<i>Bagisara rectifascia</i>	Straight-lined mallow moth	SC	
<i>Catocala herodias gerhardi</i>	Gerhard's underwing moth	SC	
<i>Cicinnus melsheimeri</i>	Melsheimer's sack bearer	T	
<i>Cingilia catenaria</i>	Chain dot geometer	SC	
<i>Euchlaena madusaria</i>	Sandplain euchlaena	SC	
<i>Faronta rubripennis</i>	Pink streak	T	
<i>Hemileuca maia</i>	Barrens buckmoth	SC	
<i>Itame</i> sp. 1 nr. <i>inextricata</i>	Pine Barrens itame	SC	
<i>Metarranthus pilosaria</i>	Coastal swamp metarranthus	SC	
<i>Oncocnemis riparia</i>	Dune noctuid moth	SC	
<i>Papaipema</i> sp.	Ostrich fern borer	SC	
<i>Papaipema sulphurata</i>	Water-willow stem borer	T	
<i>Psectraglaea carnosus</i>	Pink salween moth	SC	
<i>Zale</i> sp. 1 nr. <i>lunifera</i>	Pine Barrens zale	SC	
<b>Butterflies</b>			
<i>Callophrys irus</i>	Frosted elfin	SC	

Source: MADFW 2012

Key: E = Endangered, T = Threatened, SC = Special Concern

**Table 3-6. State-listed Flora Species Observed on Camp Edwards**

Scientific Name	Common Name	MESA Status	ESA Status
<i>Eleocharis ovata</i>	Ovate Spike-sedge	E	
<i>Ophioglossum pusillum</i>	Adder's Tongue Fern	T	
<i>Rhynchospora torreyana</i>	Torrey's Beak Rush	E	
<i>Thuja occidentalis</i>	Northern White Cedar	E	
<i>Triosteum perfoliatum</i>	Broad Tinker's Weed	E	

Source: MADFW 2012

Key: E = Endangered, T = Threatened

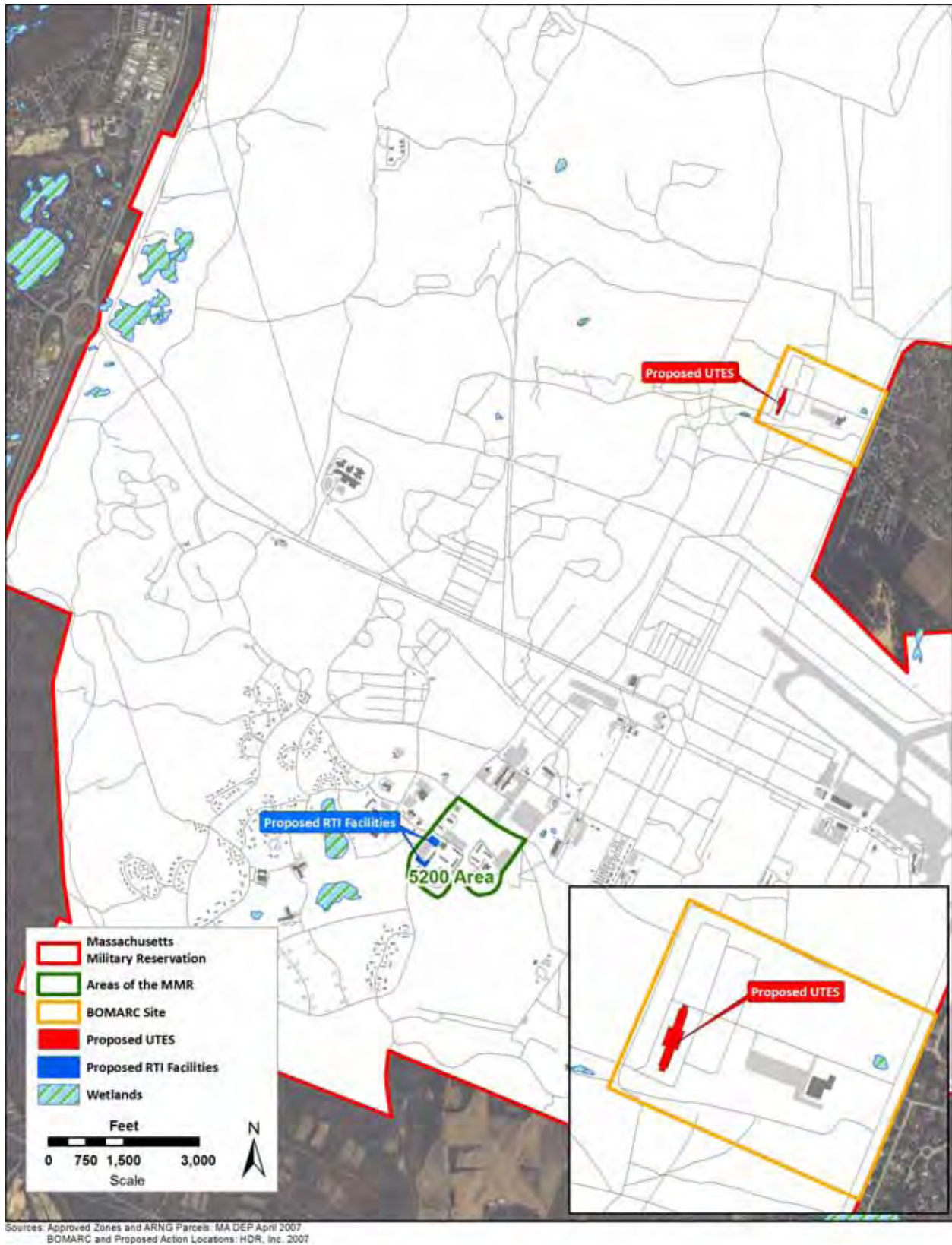


Figure 3-1. Wetlands in the Vicinity of the Proposed Action

## 3.7 Cultural Resources

### 3.7.1 Definition of the Resource

Cultural resources is an “umbrella term” for many heritage-related resources, including prehistoric and historic sites, buildings, structures, districts, objects, or any other physical evidence of human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason. Cultural resources are further defined as historic properties as defined by the National Historic Preservation Act (NHPA), cultural items as defined by the Native American Graves Protection and Repatriation Act (NAGPRA), archaeological resources as defined by the Archaeological Resources Protection Act (ARPA), sacred sites as defined in EO 13007 to which access is afforded under the American Indian Religious Freedom Act, and collections and associated records as defined in 36 CFR 79.

Several Federal laws and regulations govern protection of cultural resources, including the NHPA (1966), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990). Cultural resources are commonly subdivided into archaeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity but no structures remain standing), architectural resources (buildings or other structures or groups of structures that are of historic architectural, or other significance), and traditional cultural resources (for example, traditional gathering areas).

The NHPA defines historic properties as properties eligible for or listed in the National Register of Historic Places (NRHP). The NRHP is the official listing of properties significant in U.S. history, architecture, or prehistory, and includes both publicly and privately owned properties. The NRHP list is administered by the National Park Service. Historic properties might be buildings, structures, prehistoric or historic archaeological sites, districts, or objects that are generally 50 years of age or older, are historically significant, and that retain integrity that conveys this significance. More recent resources, such as Cold War-era buildings, might warrant listing if they have the potential to gain significance in the future or if they meet “exceptional” significance criteria. Section 106 of the NHPA requires agencies to take into account the effect of their undertakings on properties listed in or eligible for listing in the NRHP and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking.

### 3.7.2 Existing Conditions

Historic properties on Camp Edwards include historic buildings and structures. An archaeological survey of Camp Edwards is 100 percent complete, and it has identified 69 sites (MAARNG 2009b). Of these, 46 sites have been evaluated for NRHP eligibility and found ineligible and 23 require further evaluation (MAARNG 2009b). None of these sites are within the footprint of the Proposed Action.

An architectural survey of Camp Edwards has also been completed and the Massachusetts Historical Commission (Massachusetts State Historic Preservation Officer) has concurred with the MAARNG’s NRHP eligibility evaluations. Four buildings, the Range Control complex, Ammunition Supply Point complex, and two World War II temporary buildings (Buildings 102, 110, 4180, and 128), are eligible for or are listed in the NRHP (MAARNG 2009b). None of these buildings are in the vicinity of the Proposed Action. **Figure 3-2** shows the locations of these buildings.



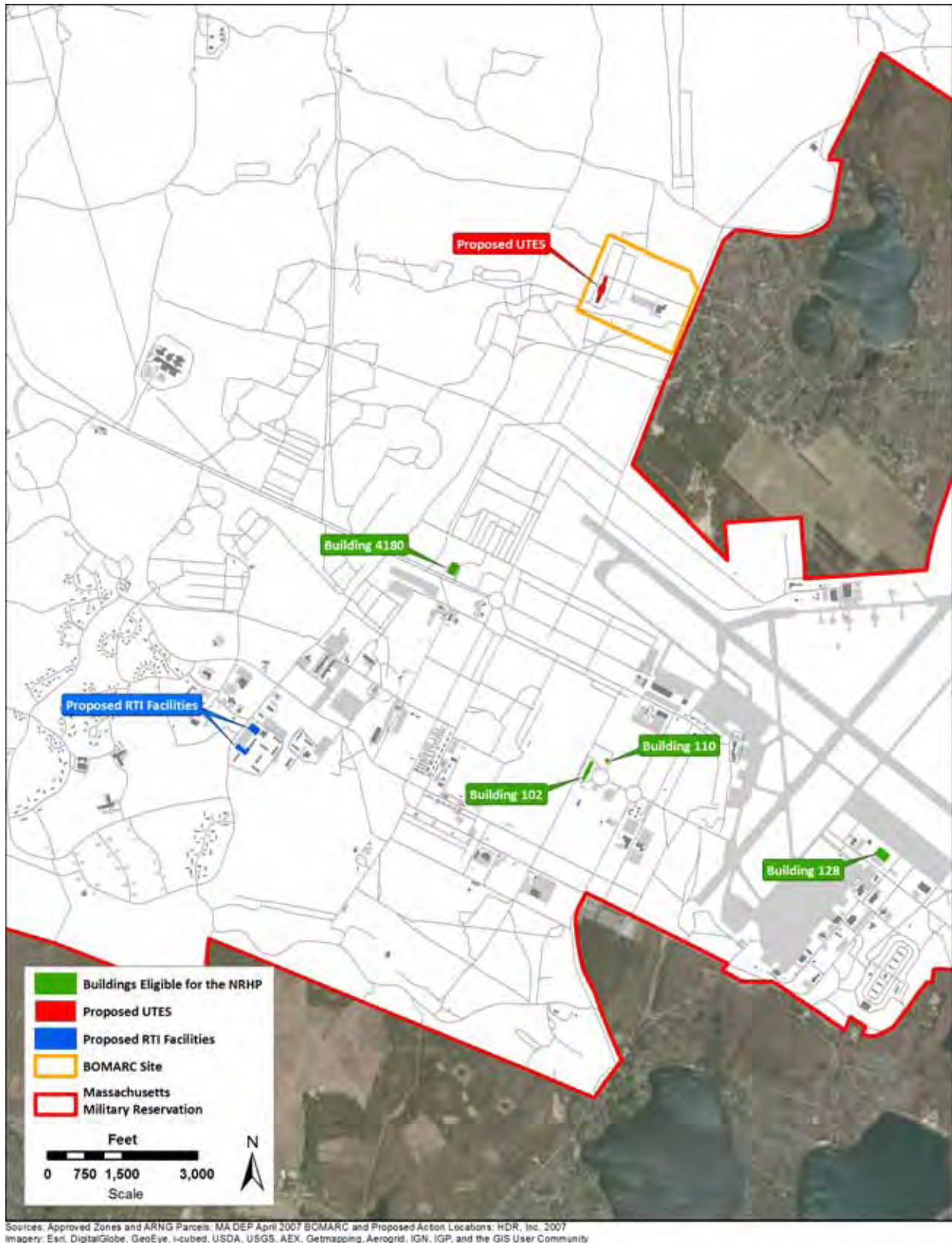


Figure 3-2. Buildings Eligible For or Are Listed in the NRHP



The existing UTES building was constructed in 1962; however, it and the associated former BOMARC Missile Complex were determined not eligible for listing in the NRHP by the Massachusetts Historical Commission in 1999 due to insufficient physical integrity (MAARNG 2001).

The MAARNG has consulted with the federally recognized Mashpee Wampanoag Tribe. No resources of traditional, religious, or cultural significance to Native American Tribes have been documented on Camp Edwards (MAARNG 2009b). All tribal consultations were performed in accordance with DOD Instruction 4710.02.

### **3.8 Socioeconomic Resources and Environmental Justice**

#### **3.8.1 Definition of the Resource**

***Socioeconomic Resources.*** Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly characteristics of population and economic activity. Regional birth and death rates and immigration and emigration affect population levels. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Changes in these fundamental socioeconomic indicators typically result in changes to additional socioeconomic indicators. Socioeconomic data at county, state, and national levels permit characterization of baseline conditions in the context of regional, state, and national trends.

Demographics and employment characteristic data provide key insights into socioeconomic conditions that might be affected by a proposed action. Demographics identify the population levels and the changes in population levels of a region over time. Demographics data might also be obtained to identify a region's characteristics in terms of race, ethnicity, poverty status, educational attainment level, and other broad indicators. Data on employment characteristics identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on personal income in a region can be used to compare the "before" and "after" effects of any jobs created or lost as a result of a proposed action. In appropriate cases, data on an installation's expenditures in the regional economy help to identify the relative importance of an installation in terms of its purchasing power and influence in the job market.

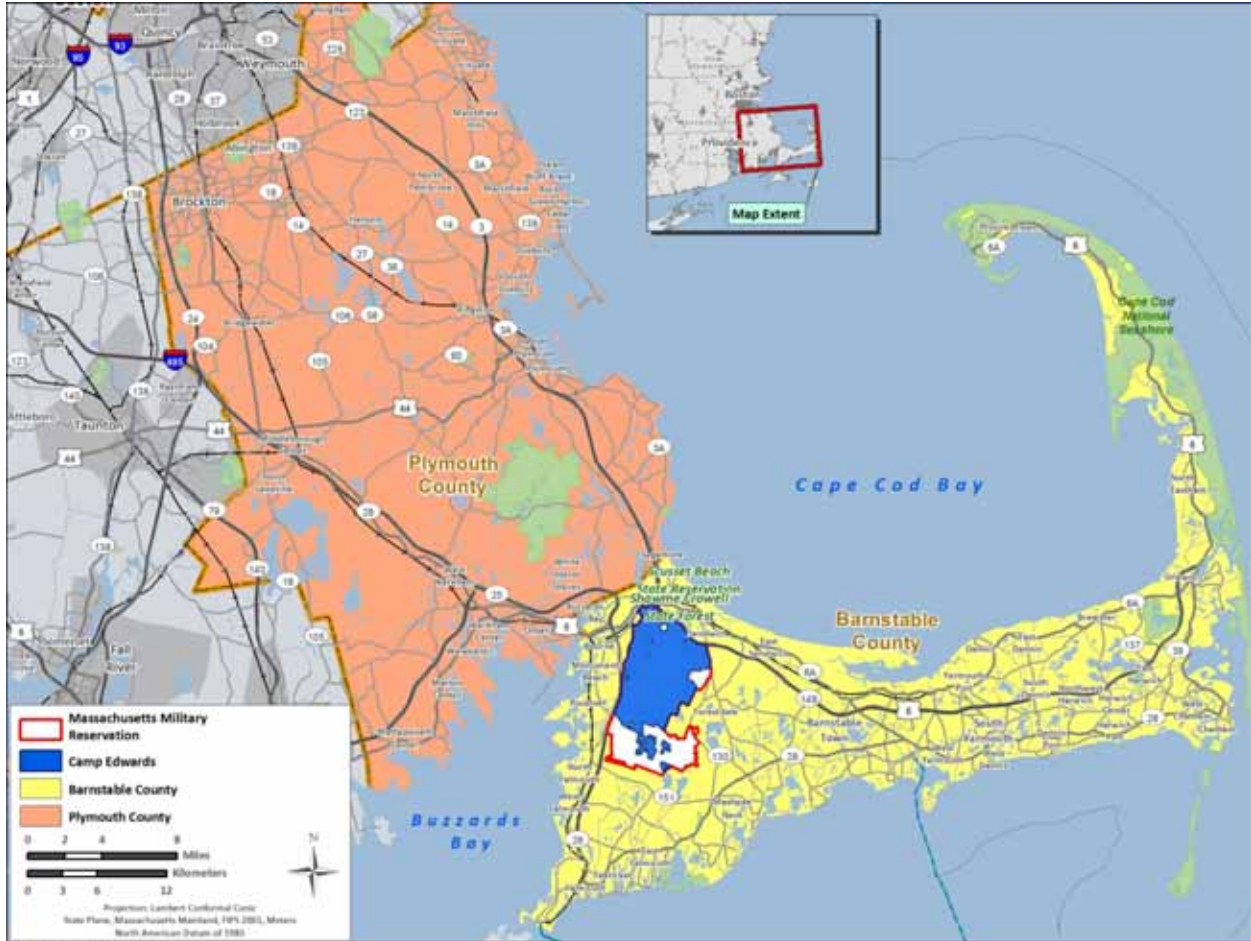
Socioeconomic data shown in this section are presented at the town, county, state, and national levels to characterize baseline socioeconomic conditions in the context of regional and state trends.

***Environmental Justice.*** EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. EO 12898 was created to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies.

Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in the EO.

### 3.8.2 Existing Conditions

**Socioeconomics.** For the purposes of this socioeconomic analysis three spatial levels are used: (1) Barnstable and Plymouth counties, which make up the Region of Influence (ROI); (2) the Commonwealth of Massachusetts; and (3) the United States. **Figure 3-3** illustrates the socioeconomic ROI. The MMR and Camp Edwards are within Barnstable County, and Plymouth County is adjacent to the northwest of Barnstable County. The ROI best illustrates the socioeconomic characteristics for the areas where most effects from the Proposed Action would occur. Data for the Commonwealth of Massachusetts provide a comparison for the ROI. Data for the United States are included to provide an additional level for comparison, when necessary.



**Figure 3-3. Socioeconomic Region of Influence for the Proposed Action**

**Demographics.** Population data from 2000 and 2010 for the ROI, Commonwealth of Massachusetts, and United States are presented in **Table 3-7**. The total population of the ROI increased slightly from 2000 to 2010 (2.3 percent); which is slightly lower than Massachusetts's population increase (3.1 percent) and considerably lower than the increase in population in the United States (9.7 percent). Barnstable County's population decreased 2.9 percent from 2000 to 2010, while the total population of Plymouth County increased 4.7 percent.

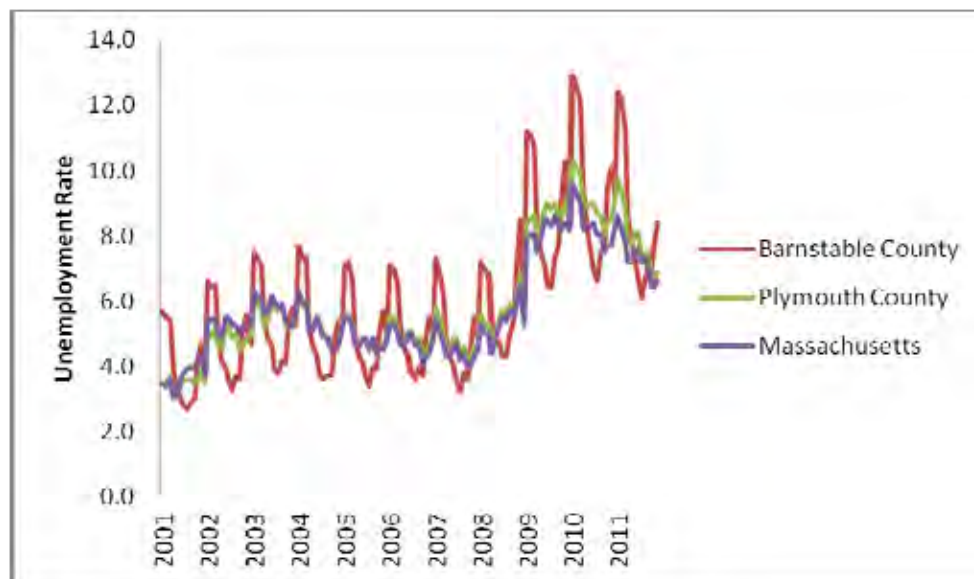
**Table 3-7. Population Data for 2000 and 2010**

Geographic Area	2000 Population	2010 Population	Percent Change
United States	281,421,906	308,745,538	9.7%
Massachusetts	6,349,097	6,547,629	3.1%
ROI	695,052	710,807	2.3%
Barnstable County	222,230	215,888	-2.9%
Plymouth County	472,822	494,919	4.7%

Sources: U.S. Census 2000, U.S. Census 2010a, and U.S. Census 2010b

**Employment Characteristics.** As of 2010, the percentage of persons in the armed forces was 0.3 percent in the ROI, 0.5 percent in Barnstable County, 0.1 percent in Plymouth County, 0.1 percent in Massachusetts, and 0.5 percent in the United States. Educational services, health care, and social assistance is the most prevalent employment type in the ROI, and in the other spatial levels. The percentage of workers in the construction industry is greater in the ROI as compared to both Massachusetts and the United States. **Table 3-8** contains information regarding employment by industry for the ROI, Massachusetts, and the United States.

From 2001 through 2011, the unemployment rate in Barnstable County varied significantly through each year with unemployment generally peaking in January and lows occurring in August. This most likely indicates a high concentration of seasonal summer jobs. Aside from this trend, unemployment rates rose in 2008. The unemployment rates in Plymouth County had a seasonal trend similar to Barnstable County but to a lesser extent. Plymouth County unemployment also rose in 2008 but exhibited a noticeable reduction after 2010. Unemployment rates in Massachusetts peaked in 2009 and have been subsiding ever since. Aside from Barnstable County's seasonal lows, unemployment rates have generally been higher than Massachusetts in both Barnstable and Plymouth counties since 2009. As of December 2011, the unemployment rates for Barnstable County, Plymouth County, and Massachusetts were 8.4 percent, 6.9, and 7.4, respectively (BLS 2011). **Figure 3-4** shows monthly unemployment rates for the Barnstable County, Plymouth County, and Massachusetts from 2001 through 2011.



Source: BLS 2011

**Figure 3-4. Unemployment Rate, 2001 to 2011**

**Table 3-8. Overview of Employment by Industry, 2010**

<b>Employment Types</b>	<b>Barnstable County</b>	<b>Plymouth County</b>	<b>ROI</b>	<b>Massachusetts</b>	<b>United States</b>
Percent of the population 16 years and over within the armed forces	0.5%	0.1%	0.3%	0.1%	0.5%
Percent of population 16 years and over in the labor force	60.7%	69.2%	66.5%	67.7%	65.0%
<b>Percent of civilian employed population 16 years and over</b>					
Construction	10.0%	8.1%	8.7%	5.9%	7.0%
Manufacturing	4.3%	7.9%	6.8%	9.9%	11.0%
Wholesale trade	2.1%	3.3%	3.0%	2.7%	3.1%
Retail trade	12.7%	12.9%	12.8%	10.7%	11.5%
Transportation and warehousing, and utilities	4.1%	4.6%	4.5%	3.8%	5.1%
Arts, entertainment, recreation, accommodation, and food services	11.1%	7.5%	8.6%	8.0%	8.9%
Educational services, and health care and social assistance	23.9%	24.2%	24.1%	26.7%	23.2%
Other services (except public administration)	5.5%	4.6%	4.8%	4.5%	4.9%
Public administration	5.1%	4.6%	4.7%	4.1%	4.8%
Agriculture, forestry, fishing and hunting, and mining	0.8%	0.5%	0.6%	0.4%	1.9%
Information	2.4%	2.3%	2.4%	2.7%	2.4%
Finance, insurance, real estate, and rental and leasing	6.5%	9.3%	8.5%	8.1%	7.0%
Professional, scientific, management, administrative, and waste management services	11.6%	10.2%	10.6%	12.7%	10.4%

Source: U.S. Census 2010a

**Environmental Justice.** The ROI for environmental justice is the Census Designated Place (CDP) of Forestdale, which is a subsection of the Town of Sandwich. A CDP is a statistical counterpart of incorporated place, and is delineated to provide data for settled concentrations of population that are identifiable by name but are not legally incorporated. The Forestdale CDP was selected as the environmental justice ROI because it is the area where the potential off-installation effects of the Proposed Action would occur. Barnstable County was used as the area of comparison.

Minority population levels within the ROI are lower than Barnstable County and considerably lower than both Massachusetts and the United States. The percent of the ROI's population reporting to be a race other than white was only 3.8 percent compared to 7.2 percent in Barnstable County, 19.6 percent in Massachusetts, and 28.0 percent in the United States. The Hispanic or Latino population within the ROI was 1.8 percent compared to 2.2 percent in Barnstable County, 9.6 percent in Massachusetts, and

16.3 percent in the United States (U.S. Census 2010a and BLS 2011). Therefore, the ROI does not include a disproportionately high percentage of minority residents.

As of 2010, the percent of individuals in the ROI that are living below the poverty level was considerably lower than those in Barnstable County, Massachusetts, and the United States. Only 1.8 percent of the ROI's population lives below the poverty threshold compared to 7.2 percent of the population in Barnstable County, 10.5 percent of the population in Massachusetts, and 13.8 percent of the population in the United States. The per capita income of people in the ROI (\$27,334) was comparable to that of Barnstable County, Massachusetts, and the United States (\$35,246, \$33,966, and \$28,257, respectively). However, the median income for families in the ROI (\$83,611) was significantly higher than for families in Barnstable County, Massachusetts, and the United States (\$60,317, \$64,509, and \$51,914, respectively) (U.S. Census 2010a). Therefore, the ROI does not represent a disproportionately high percentage of low-income residents.

The ROI, Barnstable County, Massachusetts, and the United States have similar percentages (6.3 percent, 4.1 percent, 5.6 percent, and 6.5 percent, respectively) of children under 5 years old. Therefore, the ROI does not include a disproportionately high percentage of children under 5 years old (U.S. Census 2010a). **Table 3-9** shows the 2010 demographic data for the ROI, Massachusetts, and the United States.

**Table 3-9. Minority and Low-Income Populations, 2010**

Demographic	ROI	Barnstable County	Massachusetts	United States
Total Population	4,099	215,888	6,547,629	308,745,538
Percent Male	48.8%	47.6%	48.4%	49.2%
Percent Female	51.2%	52.4%	51.6%	50.8%
Percent Under 5 Years	6.3%	4.1%	5.6%	6.5%
Percent Over 65 Years	8.7%	25.0%	13.8%	13.0%
Percent White	96.2%	92.7%	80.4%	72.4%
Percent Black or African American	0.7%	1.9%	6.6%	12.6%
Percent American Indian, Alaska Native	0.6%	0.6%	0.3%	0.9%
Percent Asian	1.2%	1.1%	5.3%	4.8%
Percent Native Hawaiian and Other Pacific Islander	0.0%	0.0%	0.1%	0.2%
Percent Some Other Race	0.3%	1.5%	4.7%	6.2%
Percent Reporting 2 or more races	1.0%	2.2%	2.6%	2.9%
Percent Hispanic or Latino	1.8%	2.2%	9.6%	16.3%
Percent of Individuals Below Poverty*	1.8%	7.2%	10.5%	13.8%
Per Capita Income	\$28,257	\$35,246	\$33,966	\$27,334
Median Household Income	\$83,611	\$60,317	\$64,509	\$51,914

Source: U.S. Census 2010a

Note: \* For the 2010 U.S. Census, the Federal poverty threshold for an individual under the age of 65 years old was \$11,344 (U.S. Census 2010c).

## 3.9 Infrastructure

### 3.9.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as urban or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. The infrastructure information contained in this chapter provides a brief overview of each infrastructure component and comments on its existing general condition. The infrastructure components to be discussed in this section include transportation systems, utilities, and solid waste management.

Transportation is defined as the system of roadways, highways, and transit services that are in the vicinity of the proposed sites and could reasonably be expected to be affected by a proposed action. Utilities include water supply, sanitary sewage, industrial wastewater, storm water, electrical power, natural gas, liquid fuel, and communications. Solid waste management primarily relates to the availability of landfills to support a population's residential, commercial, and industrial needs. Alternative means of waste disposal might involve waste-to-energy programs or incineration. In some localities, landfills are designed specifically for, and limited to, disposal of Construction and Demolition debris. Recycling programs for various waste categories (e.g., glass, metals, papers, asphalt, and concrete) reduce reliance on landfills for disposal.

### 3.9.2 Existing Conditions

**Transportation Systems.** The off-installation transportation systems serving the MMR are in good condition and provide adequate access throughout the installation. U.S. Highway 6 and State Highways 28 and 130 border the MMR to the north, west, and east, respectively. State Highway 28 provides access to the MMR via the Bourne Gate; the Sandwich Gate is accessible via State Highway 130; and the Falmouth Gate is accessible via State Highway 151. The Bourne Gate is the most commonly used gate.

The proposed UTES project areas are accessible by Greenway Road. The proposed RTI project areas are accessible by Turpentine Road and include portions of an existing parking lot. There is ample parking capacity at the proposed UTES project areas, and the RTI project area currently includes 172 automobile parking spaces and 7 bus parking spaces.

**Electrical System.** The electrical system on the MMR is operated by NSTAR through two overhead 25,000-volt transmission lines. The electric distribution system consists of nearly 43 miles of overhead power lines and limited underground feeders near the airfield (USACE 2000, KeySpan 2005). The primary substation is on the western side of the MMR and serves the non-airfield Cantonment Area (which includes the proposed UTES and the proposed RTI project areas). A second substation on the eastern side of the MMR serves the Otis ANG Base. In 2007, Camp Edwards evaluated the need for a new electrical substation (MAARNG 2007b).

The electrical system at the existing UTES consists of an overhead 12.47-kilovolt line (MAARNG 2007c). This line is a part of the installation's overhead primary electrical distribution system. There are currently no primary overhead electrical lines that extend to the area of the proposed UTES facility (MAARNG 2011c). The closest overhead electrical line is approximately 300 feet away from the southern tip of the proposed UTES facility. Electrical utilities are in the immediate vicinity of the proposed RTI project areas (MAARNG 2006b).



**Natural Gas System.** The KeySpan Gas Company supplies natural gas to the Cantonment Area of the MMR. The gas distribution lines are owned, operated, and maintained by KeySpan and its subsidiary Colonial Gas Company. Natural gas is currently available on Greenway Road, and the natural gas piping extends to the existing UTES facility but not to the site of the proposed UTES facility (MAARNG 2007c). The proposed RTI project areas are immediately adjacent to a 2-inch natural gas pipeline (MAARNG 2007b and MAARNG 2006b).

**Liquid Fuel Supply.** There are no underground storage tanks (USTs) at the proposed UTES and RTI project areas (MAARNG undated b).

**Water Supply System.** The Upper Cape Regional Water Supply Cooperative provides water to six public water supply systems (i.e., Bourne Water District, Mashpee Water District, Sandwich Water District, the Town of Falmouth water system, the Barnstable County Correctional Facility, and the Otis ANG Base water supply system). In FY 2011, the Cooperative supplied a total of 409,472,000 gallons of water with a daily average of 1,122,000 gallons (MAARNG 2011a).

The Otis ANG Base water supply system supplies water to the general Cantonment Area of Camp Edwards. In FY 2011, the Otis ANG Base's J-Well pumped an average of approximately 167,400 gallons of water per day (totaling 61,087,000 gallons in FY 2011). In addition, the Otis ANG Base received a total of 60,547,000 gallons from the Cooperative (165,882 gallons per day) in FY 2011. On average, the Otis ANG Base water supply system used approximately 333,222 gallons of water per day in FY 2011 (MAARNG 2011a).

The J-Well is in the Cantonment Area along Herbert Road on the northern side of the Otis ANG airfield. In 2009, the Otis ANG Base water supply system was authorized to withdraw an average volume of 540,000 gallons per day and a total annual volume of 197.1 million gallons (MAARNG 2011a).

Water lines are currently connected to the existing UTES building and are in the immediate vicinity of the proposed UTES and RTI project areas. There is a water main at the southern portion of the proposed UTES facility (MAARNG 2011c and MAARNG 2006b).

**Sanitary Sewer and Wastewater Systems.** The Otis ANG Base sanitary sewer system provides wastewater service to the Cantonment Area of Camp Edwards. In FY 2011, the Otis ANG Base wastewater treatment plant discharged a total of 51,115,000 gallons (140,000 gallons per day). This volume is far below the permitted daily average of 360,000 gallons per day. Since FY 2002, sewage discharge has not exceeded a daily average of 179,000 gallons (MAARNG 2011a).

There are sewer lines connected to the existing UTES building and are in the immediate vicinity of the proposed UTES and RTI project areas. No sewer lines extend to the site of the proposed UTES facility (MAARNG 2011c and MAARNG 2006b). The closest sewer line is approximately 300 feet away from the southern tip of the proposed UTES facility.

**Storm Water System.** A storm drain at the existing UTES facility transports storm water directly to the open ditch south of the facility (MAARNG 2007b). A small detention basin is in the wooded area along Greenway Road collects storm water runoff from the northeastern portion of the existing UTES. The outfall structure and pipe from this basin are connected to the existing drainage system that discharges to the lower elevations of the woodland south of the existing UTES facility (MAARNG 2007c).

At the proposed UTES project areas, multiple drainage swales surround the perimeter of the pavements to handle the storm water from the impervious and semi-impervious surfaces. These sediment-laden, grassy, and occasionally heavily vegetated swales are well-defined depressions of varying depths and serve to

collect surface flows from the area. Storm water collected in the swales flow directly into woodland south of the proposed UTES site (MAARNG 2007c). There are three storm water detention basins in the vicinity of the proposed UTES project areas, including the basin along Greenway Road.

The proposed UTES project areas are within the former BOMARC Missile Complex, which is mostly covered with crushed stone, gravel, and pavement. Vegetation at the former BOMARC complex consists of small trees and shrubs but is limited to the drainage swales and wooded areas surrounding the perimeter of the complex. There is a network of storm water pipes in the vicinity of the proposed RTI project area (MAARNG 2006b).

**Communications System.** Communications on the MMR are the responsibility of the 102nd Communications Flight of the MAARNG. The MAARNG recently has installed a new communications cable plant for all serviced customers. There is existing communications infrastructure available in the vicinity of the proposed UTES and RTI project areas.

**Solid Waste Management.** Solid waste at the MMR is collected by a commercial contractor and delivered to the Falmouth Transfer Station. Most of the material goes a waste-to-energy site that serves as a regional alternative to landfill disposal. The Falmouth Transfer Station receives eight rail cars (about 30 tons each) every day in the summer and four per day in the winter. Solid waste produced at Camp Edwards that cannot be used to produce energy is hauled via freight train either to the Bourne Landfill (regional landfill alternative) or to the SEMASS Resource Recovery Facility in West Wareham, Massachusetts (primary long-term disposal service for southeastern Massachusetts and Cape Cod) (MAARNG 2005b).

The Facilities Engineering Division at Camp Edwards has established a drop-off and consolidation point for construction and demolition debris, scrap metal, cardboard, newsprint, and high-grade office paper. Concrete is reused for roadbed materials and scrap metal is recovered and sold at the commodities market (MAARNG 2005b).

In August, 2010, the MAARNG published a Statewide Integrated Solid Waste Management Plan for all of its Army National Guard facilities. Chapter 8 of the Plan stipulated solid waste management procedures specific to Camp Edwards (MAARNG 2011a). The Plan establishes “MAARNG policy, responsibilities, goals, and objectives for compliance with statutory requirements for waste minimization, recycling, and solid waste disposal; documents current waste management practices; and identifies and evaluates potential improvements to current practices.” The Plan also includes a comprehensive source reduction plan for Camp Edwards (MAARNG 2010b).

**Pollution Prevention.** The Camp Edwards Pollution Prevention Overview establishes operational, administrative, and range design BMPs. The overview also establishes range specific BMPs. Besides hazardous waste containment and management systems and the previously discussed storm water management features, there is no other pollution prevention infrastructure at the proposed UTES or RTI project areas.

### **3.10 Hazardous Materials and Wastes**

#### **3.10.1 Definition of the Resource**

Hazardous materials are defined by 49 CFR 171.8 as “hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions” in

49 CFR Part 173. Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations within 49 CFR Parts 105–180.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) at 42 U.S.C. §6903(5), as amended by the Hazardous and Solid Waste Amendments, as “a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.” In the Commonwealth of Massachusetts, hazardous wastes are regulated under 310 CMR 30.000. Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR Part 273 and 310 CMR 30.1000. Four types of waste are currently covered under the universal waste regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos-containing material (ACM), polychlorinated biphenyls (PCBs), and lead-based paint (LBP). The USEPA has given authority to regulate these special hazard substances by the Toxic Substances Control Act (TSCA) Title 15 U.S.C. Chapter 53. The USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR Part 763 with additional regulation concerning emissions (40 CFR Part 61). Whether from lead abatement or other activities, depending on the quantity or concentration, the disposal of the LBP waste is regulated by the RCRA at 40 CFR 260. The disposal of PCBs is addressed in 40 CFR Parts 750 and 761. The presence of special hazards or controls over them might affect, or be affected by, a proposed action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a proposed action.

Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*, incorporates the requirements of all Federal regulations and DOD Directives for pollution prevention and the management of hazardous materials, hazardous wastes, and special hazards.

### **3.10.2 Existing Conditions**

The information provided in this section focuses on the presence and management of hazardous materials and wastes associated with the proposed construction and demolition areas.

***Hazardous Materials and Petroleum Products.*** Camp Edwards uses two plans extensively to ensure continuous compliance and consistent management of all materials and wastes while ensuring a rapid response to any potential spills or releases to the environment.

The MAARNG Hazardous Material and Waste Management Plan prescribes responsibilities, policies, and procedures for storing and managing hazardous materials and wastes while emphasizing pollution prevention within the MAARNG. The plan ensures compliance with applicable Federal, state, and local laws and regulations and provides step-by-step procedures for setting up and managing storage areas for hazardous materials and setting up and managing Waste Accumulation Areas. Record keeping, inspections, waste turn-in, and training requirements are discussed as well as strategies for sustainable pollution prevention activities (MAARNG undated a).

The Camp Edwards Integrated Contingency Plan (ICP) is a document that provides single guidance for emergency preparedness and response for all of Camp Edwards. It includes USEPA's Spill Prevention Control and Countermeasure Plan (40 CFR part 112), Hazardous Waste Contingency Plan and Emergency Response Procedures (310 CMR 30.520), OSHA Emergency Response Regulations (29 CFR 1910.20), and the Army Installation Spill Contingency Plan from AR 200-1. The purpose of the ICP is to minimize hazards to human health and the environment, establish duties and responsibilities for responding personnel, and familiarize local emergency responders with internal procedures. The ICP also incorporates the elements of storm water pollution prevention procedures to eliminate, minimize, or reduce the amount of pollutants into storm water (MAARNG 2009c).

Building 4601 is predominantly a vehicle maintenance and equipment storage facility. Multiple Heavy Expanded Mobility Tactical Trucks with 2,500-gallon storage tanks can be located on the premises, but they are kept empty and only at the UTES for repair and maintenance. A Petroleum, Oils, and Lubricants (POL) storage shed is located adjacent to Building 4601 and includes all safeguards required by Federal and local regulations. A survey of regulated materials was conducted in late 2011 at Building 4601, and this survey identified numerous hazardous materials and petroleum products at Building 4601. The items noted during the survey included nine mercury thermostats, two 20-gallon oil storage tanks, ten petroleum-based product drums, and various cans of grease and oil paint cleaning products (MAARNG 2011d). No hazardous materials or petroleum products are stored in the remainder of the proposed UTES project area.

No hazardous materials or petroleum products are stored within the proposed RTI project area.

**Hazardous and Petroleum Wastes.** Camp Edwards is a RCRA large-quantity waste-generating facility, in that, historically, generated more than 2,200 pounds (1,000 kilograms or 1 metric ton) of hazardous waste or more than 2.2 pounds (1 kilogram) of acute hazardous waste per calendar month. Camp Edwards must adhere to the requirements for large-quantity generators, including biennial reporting of hazardous wastes it transports off site for treatment and disposal. These reports are submitted in March of even-numbered calendar years for the preceding odd-numbered year. Camp Edwards did not complete the calendar year 2011 biennial report because the installation did not generate sufficient quantities of hazardous wastes to be considered a large-quantity-generator. A letter of explanation was submitted to the appropriate agencies.

**Table 3-10** reflects the data reported in the biennial hazardous waste reports for Camp Edwards for the past five biennial reports. The data reported are for hazardous waste generated from the day-to-day operational activities at Camp Edwards from both the Cantonment Area and the Training Lands Reserve; they do not include hazardous waste generated from other activities such as remediation and demolition. The reduction in hazardous waste is attributed to implementation of various pollution prevention program initiatives (i.e., replacement of solvent parts washers with aqueous-based parts washers, re-use of JP-8, and purchasing of re-refined oil through closed-loop oil systems) and operational factors (i.e., deployment of soldiers and equipment to support ongoing worldwide military missions and reduction of assigned tracked vehicles). Although the decrease in the amount of hazardous waste disposed over the past few years is noteworthy, hazardous waste disposal volumes could increase in the future due to changes in quantity and types of vehicles assigned to MAARNG units and the return of MAARNG soldiers and equipment from overseas deployments. In the most recent biennial hazardous waste report for Camp Edwards (submitted March 2010 for Calendar Year 2009), the three most common hazardous waste streams were waste paint and paint-related materials, waste flammable liquids (e.g., JP-8 fuel), and waste flammable solids (e.g., rags and cleaning materials containing JP-8). These three waste streams accounted for the majority of the total weight of the hazardous waste disposed of at Camp Edwards (MAARNG 2010a).

**Table 3-10. Hazardous Waste Disposal on Camp Edwards**

<b>Calendar Year</b>	<b>Hazardous Waste Disposal (tons)</b>
2009	1.3
2007	2.9
2005	3.6
2003	3.8
2001	8.0

**Notes:**

1. Federal law requires hazardous waste generators to report the quantities, nature, and disposition of generated hazardous wastes to the USEPA, or authorized states, every 2 years. These reports are submitted during March of even-numbered calendar years for the preceding odd-numbered year.
2. The above numbers reflect hazardous waste disposal from day-to-day operational activities at Camp Edwards; they do not include hazardous waste generated from other activities such as remediation and demolition.
3. Disposal information includes wastes from both the Cantonment Area and the Training Lands Reserve.

Building 4601 is predominantly a vehicle maintenance and equipment storage facility. The building contains a 660-gallon waste oil bowser aboveground storage tank, which is managed and operated like a 90-day storage area in accordance with Massachusetts Hazardous Waste Regulations 310 CMR 30.000. Additionally, six 55-gallon drums of hazardous waste and 1 waste oil disposal system were identified at Building 4601 during a survey of regulated materials conducted in late 2011 (MAARNG 2011d). No hazardous or petroleum wastes are stored in the remainder of the proposed UTES project area.

No hazardous or petroleum waste storage facilities are associated with the proposed RTI project area.

**Asbestos-Containing Material.** Asbestos is regulated by the USEPA under the CAA; TSCA; and Comprehensive Environmental Response, Compensation, and Liability Act. USEPA has established that any material containing more than 1 percent asbestos by weight is considered an ACM.

AR 420-70, *Facilities Engineering Buildings and Structures*, provides policies and guidance for use when performing real property maintenance and repair of buildings and structures. AR 420-70 requires an installation to develop an asbestos hazard management plan for the purpose of maintaining a record of the status and condition of ACM in installation facilities, and documenting asbestos management efforts including provisions for training of workers, work practices, abatement alternatives, in-place management work practices, surveillance monitoring, state or local reporting requirements, and environmental response procedures.

An ACM inspection of Building 4601 was performed in late 2011. As part of this inspection, 78 samples of suspected ACMs were collected, and 11 of these samples tested positive for asbestos. ACMs at Building 4601 include caulking, floor tiles, and fitting insulation (MAARNG 2011d).

Underground water supply lines on the installation are reportedly constructed with asbestos-cement piping (Army and USAF 2004); including the proposed UTES project area. Because the BOMARC shelters were demolished between 2002 and 2006, it is assumed that any ACM associated with these structures was properly removed from the proposed UTES project area.

Underground water supply lines on the installation, including the proposed RTI project area, are reportedly constructed with asbestos-cement piping (Army and USAF 2004).

**Lead-Based Paint.** The Federal government banned the use of most LBP in 1978; therefore, all buildings constructed prior to 1978 are assumed to contain LBP. Federal agencies are required to comply with applicable Federal, state, and local laws related to LBP activities and hazards. AR 420-70 provides policies and guidance for use when performing real property maintenance, repair, and demolition of buildings and structures.

Building 4601 was constructed in 1962; therefore, the potential for LBP exists. Nine paint chip samples suspected to be LBP were taken from Building 4601 in late 2011. Two of these samples, taken from an exterior door and the rear bay, were found to be LBP. The other seven samples contained Pb but at levels below the Federal statute of 0.5 percent by weight (MAARNG 2011d).

No LBP is known or suspected to exist in the remainder of the proposed UTES project area. Because the BOMARC shelters were demolished between 2002 and 2006, it is assumed that any LBP associated with these structures was properly removed from the proposed UTES project area.

There are no buildings within the proposed RTI project area; therefore, it is assumed that LBP is not present.

**Polychlorinated Biphenyls.** PCBs are a group of chemical mixtures used as insulators in electrical equipment such as transformers and fluorescent light ballasts. Chemicals classified as PCBs were widely manufactured and used in the United States throughout the 1950s and 1960s. PCBs could be present in products and materials produced before the 1979 ban. Common products that might contain PCBs include electrical equipment (e.g., transformers and capacitors), hydraulic systems, and fluorescent light ballasts.

A survey of regulated materials conducted in late 2011 at Building 4601 identified 114 8-foot-fluorescent light bulbs, 312 4-foot-fluorescent light bulbs, 388 ballasts, and 23 hydraulic door stops (MAARNG 2011d). These items might contain PCBs (MA ARNG 2011d). There are no other known or suspected sources of PCBs within the remainder of the proposed UTES project area. There is no evidence of PCB contamination at the proposed UTES project area.

There are no known or suspected sources of PCBs or PCB contamination within the proposed RTI project area.

**Reclaimed Asphalt Pavement.** As part of a supplemental environmental project, Camp Edwards has developed a program for the removal of pavement associated with past infrastructure throughout the cantonment area. Once asphalt is removed, many of the new permeable areas are expected to naturally return to native grassland providing additional habitat for numerous bird species and small mammals.

In October 2005, the MassDEP amended 310 CMR 19.017 to add certain construction and demolition materials (e.g., asphalt pavement, brick, concrete, metal, and wood) to the list of items prohibited from disposal, transfer for disposal, or contracting for disposal. The MassDEP worked with a “Construction and Demolition Subcommittee” to develop the disposal prohibition of these construction and demolition debris materials. The Construction and Demolition Subcommittee was comprised of architects, engineers, building owners, contractors, haulers, construction and demolition processors, landfill owners, transfer station owners, municipalities, environmental groups, trade associations, law firms, and consultants. The Construction and Demolition Subcommittee identified that there are recycling and reuse markets for asphalt pavement, brick, concrete, metal, and wood, and this material is routinely diverted



from disposal. Specifically, it was recommended that asphalt be reclaimed for the further use in road and parking area construction.

**Installation Restoration Program.** There are two independent clean-up programs at the MMR, the Installation Restoration Program (IRP) and the Impact Area Groundwater Study Program (IAGWSP), both of which deal with the contamination of the soil and groundwater aquifer. As a result of previous activities (i.e., disposing of wastes in unlined landfills and drywells, dumping and burning wastes, and rinsing wastes down drains), Camp Edwards and the MMR were placed on the National Priorities List (NPL) in 1989. Unexploded ordnance surveys are conducted under the IAGWSP. To study and determine the extent of groundwater contamination from past practices, the programs have installed thousands of monitoring wells on the MMR and in surrounding communities, and collected numerous soil samples to help identify source areas of contamination. Both programs have used groundwater modeling as part of the investigation process, and have coordinated with the USGS to determine groundwater flow and effects on the zones of contribution to the communities' drinking water supplies.

The USEPA designated two NPL sites, collectively designated as Operable Unit 8, within the UTES Complex. Fuel Spill 24 (FS-24) was a spill of approximately 500 gallons of fuel oil from a 25,000-gallon UST. Chemical Spill 10 (CS-10) was a release of various fluids related to vehicle maintenance (including degreasers, petroleum products, and other materials). These materials were released to the site through storm drains, dry wells, and infiltration areas as a result of historical disposal practices (MAARNG 2011b).

The FS-24 fuel spill was remediated in 1985 by removal of the UST and excavation of petroleum-contaminated soil. The CS-10 soil contamination was remediated by closure of drainage structures in 1996 and a combination of soil removal and operation of soil-vapor extraction systems, which operated from 2002 to 2004. Groundwater remediation associated with the CS-10 groundwater plume is ongoing and includes extraction, treatment, and reinjection of approximately 5 million gallons of contaminated groundwater per day. In 2009, a Preliminary Close-Out Report was issued for the MMR NPL site. This report stated that all remedial activities at the MMR site were complete and that remaining remediation activities involve the operation and maintenance of engineered controls (i.e., groundwater remediation systems) (MAARNG 2011b).

As a result of cleanup efforts, the CS-10 groundwater plume has been remediated so that groundwater containing regulated levels of compounds of concern is no longer located directly beneath the footprint of the proposed UTES project area (MAARNG 2011b).

No IRP or IAGWSP sites are associated with the proposed RTI project area.

**Pesticides.** AR 200-1 provides guidance for pest management programs at U.S. Army installations. The MAARNG Pest Management Plan identifies elements of the program to include health and environmental safety; pest identification; pest management; and pesticide storage, transportation, use, and disposal. The plan is to be used as a tool to reduce reliance on pesticides, to enhance environmental protection, and to maximize the use of integrated pest management techniques.

No pesticides, insecticides, or herbicides are known to have been stored, mixed, or disposed of within Building 4601 or the proposed UTES or RTI project areas.

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## 4. Environmental Consequences

This section presents an evaluation of the environmental effects that could result from implementing the Proposed Action or the No Action Alternative. This chapter focuses on effects considered potentially significant. The general approach followed throughout this section is to describe briefly the range of effects that would occur and then provide a discussion of effects that are considered significant.

The specific criteria for evaluating potential environmental effects of the Proposed Action or the No Action Alternative are also presented under each resource area. The significance of an action is measured in terms of its context and intensity. The following elaborates on the nature of characteristics that might relate to various environmental effects. Individual resource area presentations provide more subject-specific evaluation criteria.

**Short-term or long-term.** In general, short-term effects are those that would occur only with respect to a particular activity or for a finite period or only during the time required for construction or installation activities. Long-term effects are those that are more likely to be persistent and chronic.

**Direct or indirect.** A direct effect is caused by an action and occurs around the same time at or near the location of the action. An indirect effect is caused by an action and might occur later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action.

**Minor, moderate, or significant.** These relative terms are used to characterize the magnitude or intensity of an effect. A minor effect is slight, but detectable. A moderate effect is readily apparent. Significant effects are those that, in their context and due to their intensity (severity), have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR 1508.27) and, thus, warrant heightened attention and examination for potential means for mitigation in order to fulfill the policies set forth in NEPA.

**Adverse or beneficial.** An adverse effect is one having unfavorable or undesirable outcomes on the man-made or natural environment. A beneficial effect is one having positive outcomes on the man-made or natural environment.

### 4.1 Land Use

#### 4.1.1 Evaluation Criteria

The significance of potential land use effects is based on the level of land use sensitivity in areas affected by a proposed action and the compatibility of proposed actions with existing conditions. In general, a land use effect would be significant if it were to cause the following:

- Be inconsistent or in noncompliance with existing land use plans or policies
- Preclude the viability of existing land use
- Preclude continued use or occupation of an area
- Be incompatible with adjacent land use to the extent that public health or safety is threatened
- Conflict with planning criteria established to ensure the safety and protection of human life and property.

#### **4.1.2 Effects of the UTES Component**

Implementation of the UTES component of the Proposed Action would not result in adverse effects on land use plans or policies associated with long-term planning. While the Final Area-wide EIR for the MAARNG Properties at the MMR identified the 3600 Area of Camp Edwards as the proposed location for the new UTES, a subsequent planning document (Site Consolidation Plan) sited it in the general vicinity of the proposed UTES site analyzed in this EA. Therefore, the Proposed Action would be consistent with the recommendation provided in the Site Consolidation Plan.

The Proposed Action could result in short-term and long-term, minor, adverse effects on land use policies and plans associated with groundwater protection. The UTES component would be within the Sandwich Water Resources Protection Overlay District. This area has a set of use restrictions and regulations governing activities and land uses. During construction and operation of the UTES and the controlled-humidity building, the storage and use of hazardous materials and generation of hazardous wastes would increase; however, hazardous materials and wastes would be handled in accordance with practices established by the MAARNG and all Federal and commonwealth regulations. The UTES and controlled-humidity building would need to be permitted because they would be considered small-quantity generators of hazardous waste.

Construction of the UTES component of the Proposed Action could result in short-term, negligible, adverse effects on surrounding land uses due to increases in noise. All demolition and construction activities under the UTES component of the Proposed Action would occur within the former BOMARC Missile Complex at Camp Edwards. The proposed UTES and controlled-humidity building would be within the same general area as the existing UTES facilities; therefore, the Proposed Action would result in a continuation of existing land uses and would not introduce incompatible land uses. The proposed UTES would be constructed on a previously disturbed area that is currently vacant. The proposed controlled-humidity building would be constructed within the former footprint of the existing UTES (Building 4601). Construction of UTES and controlled-humidity building at these sites would not preclude the viability of existing land uses or prevent the continued use of facilities within the former BOMARC Missile Complex. There would be a negligible increase in noise and general disturbance associated with demolition and construction activities, which could create a short-term annoyance for any personnel and other people in the vicinity of the work activities, including residents in the Forestdale residential area. Operation of the UTES could result in intermittent noise; however, it would be similar to existing conditions.

The UTES component of the Proposed Action would not result in effects on any planning criteria established to ensure the safety and protection of human life and property.

#### **4.1.3 Effects of the RTI Component**

Implementation of the RTI component of the Proposed Action would not result in adverse effects on land use plans or policies associated with long-term planning. As stated previously, the Site Consolidation Plan recommends RTI improvements, including two new buildings, in the same locations that are proposed in this EA. Therefore, the Proposed Action would be consistent with the recommendation provided in the Site Consolidation Plan.

The Proposed Action could result in short-term, minor, adverse effects on land use policies and plans associated with groundwater protection. The RTI component would be within the Sandwich Water Resources Protection Overlay District. This area has a set of use restrictions and regulations governing activities and land uses. During construction of the proposed education building and barracks, the storage and use of hazardous materials and generation of hazardous wastes would increase; however, hazardous

materials and wastes would be handled in accordance with practices established by the MAARNG and all Federal and commonwealth regulations.

Construction of the RTI component of the Proposed Action could result in short-term, negligible, adverse effects on surrounding land uses due to increases in noise. All construction activities under the RTI component of the Proposed Action would occur within the 5200 Area at Camp Edwards. There would be a negligible increase in noise and general disturbance associated with demolition and construction activities, which could create a short-term annoyance for any personnel and other people in the immediate vicinity of the work activities.

Operation of the RTI component of the Proposed Action could result in long-term, minor, adverse effects on surrounding land uses due to the permanent removal of parking spaces. The proposed education building and barracks would be within the same general area as the existing RTI facilities; therefore, the Proposed Action would result in a continuation of existing land uses and would not introduce incompatible land uses. The proposed education building and barracks would be constructed partially on grass and partially on an existing parking lot. Due to siting within an existing parking lot, construction of these facilities would remove 30 car parking spaces and 7 bus parking spaces. Construction of the proposed education building and barracks would not preclude the viability of any other existing land uses or prevent the continued use of facilities within the 5200 Area.

The RTI component of the Proposed Action would not result in effects on any planning criteria established to ensure the safety and protection of human life and property.

#### **4.1.4 Effects of the No Action Alternative**

Under the No Action Alternative, the MAARNG would not implement either component of the Proposed Action. Existing land use conditions would continue as described in **Section 3.1.2**. No effects would be expected.

### **4.2 Air Quality**

#### **4.2.1 Evaluation Criteria**

The evaluation criteria are dependent on whether the Proposed Action is located in an attainment, nonattainment, or maintenance area for criteria pollutants. Other evaluation criteria include whether Major New Source Review (NSR) air quality construction permitting is triggered or Title V operating permitting is triggered. Major New Source Review air quality construction permitting is divided into Nonattainment Major NSR (NANSR) for nonattainment pollutants and PSD permitting for attainment pollutants. All of these evaluation criteria are discussed below.

**Attainment Area Pollutants.** The attainment area pollutants for the location of this Proposed Action are CO, NO<sub>2</sub>, SO<sub>2</sub>, Pb, PM<sub>10</sub>, and PM<sub>2.5</sub>. The effect in NAAQS “attainment” areas would be considered significant if the net increases in these pollutant emissions from the Federal action would result in any one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Exceed any Evaluation Criteria established by a SIP

- Effects on ambient air quality were generally assessed by comparing the increase in emissions under the Proposed Action to the county or AQCR emissions inventory.

**Nonattainment or Maintenance Area Pollutants.** The nonattainment area pollutant for the location of this Proposed Action is O<sub>3</sub> (measured as NO<sub>x</sub> and VOCs). Effects on air quality in NAAQS “nonattainment” areas are considered significant if the net changes in these project-related pollutant emissions result in any of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard.
- Increase the frequency or severity of a violation of any ambient air quality standard.
- Delay the attainment of any standard or other milestone contained in the SIP.
- With respect to the General Conformity Rule, effects on air quality would be considered significant if the proposed Federal action emissions exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been redesignated as a maintenance area. In addition, if a facility has a specific general conformity budget listed in the SIP, a proposed action that results in an exceedance of that budget would be considered a significant effect on air quality. MAARNG is not specifically listed in the Massachusetts SIP as having a specific General Conformity budget.

**Table 4-1** presents the General Conformity *de minimis* thresholds, by regulated pollutant. As shown in this table, *de minimis* thresholds vary depending on the severity of the nonattainment area classification.

Note that emissions sources subject to NANSR, PSD, or even Minor NSR air permitting are not required to be counted towards the General Conformity *de minimis* thresholds. The reasoning for this is they would already be required to go through an approval process with the appropriate Federal, state, or local air quality regulatory authority.

**Nonattainment Major NSR Permits.** The following factors were considered in determining the significance of air quality effects with respect to NANSR permitting requirements:

- If the net increase in stationary source emissions qualify as a NANSR major source. This major source threshold varies from 10 tpy to 100 tpy for nonattainment pollutants depending on the severity of the nonattainment classification and the pollutant (40 CFR 51.165).

**PSD and Title V Permits.** The following factors were considered in determining the significance of air quality effects with respect to PSD permitting requirements prior to construction:

- If the net increase in stationary source emissions qualify as a PSD major source. This includes 250 tpy emissions per attainment pollutant (40 CFR 52.21(b)(1) and 40 CFR 52.21(a)(2), or 75,000 tpy emissions of GHGs.
- If the net increase in stationary source emissions qualify as a significant modification to an existing PSD major stationary source (i.e., change that adds 15 to 40 tpy to the facility’s potential to emit depending on the pollutant).
- If the Proposed Action occurs within 10 kilometers of a Class I area and if it would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 µg/m<sup>3</sup> or more (40 CFR 52.21[b][23][iii] and 40 CFR 52.21[a][2]).



**Table 4-1. Conformity *de minimis* Emissions Thresholds**

<b>Pollutant</b>	<b>Status</b>	<b>Classification</b>	<b><i>de minimis</i> Limit (tpy)</b>
O <sub>3</sub> (measured as NO <sub>x</sub> or VOCs)	Nonattainment	Extreme Severe Serious Moderate/marginal (inside ozone transport region) All others	10 25 50 50 (VOCs)/100 (NO <sub>x</sub> ) 100
	Maintenance	Inside ozone transport region Outside ozone transport region	50 (VOCs)/100 (NO <sub>x</sub> ) 100
CO	Nonattainment/ maintenance	All	100
PM <sub>10</sub>	Nonattainment	Serious Moderate No Special Classification	70 100 100
	Maintenance	All	100
PM <sub>2.5</sub> (measured directly, or as SO <sub>2</sub> , or NO <sub>x</sub> , or VOC as significant precursors)	Nonattainment/ maintenance	All	100
SO <sub>2</sub>	Nonattainment/ maintenance	All	100
NO <sub>x</sub>	Nonattainment/ maintenance	All	100
VOC	Nonattainment/ maintenance	All	100
Pb	Nonattainment/ maintenance	All	25

Source: 40 CFR 93.153, as of 9 January 2012

The following factor was considered in determining the significance of air quality effects with respect to Title V operating permit requirements (40 CFR 71.2 and 40 CFR 71.3):

- If the increase in stationary source emissions under the Proposed Action qualify as a Title V major source. This includes the potential to emit 100 tpy for criteria pollutants (lower thresholds apply in nonattainment areas and depend on the pollutant and severity of nonattainment), or 10 tpy of any individual HAP, or 25 tpy of all HAPs combined, or 100,000 tpy of GHGs.

Only operational emissions increases were evaluated for PSD and Title V permitting effects as construction activity emissions are typically not subject to the above significance criteria for these permit programs.

## 4.2.2 Effects of the UTES Component

**Emission Estimates.** Short-term, minor, adverse effects on air quality would be expected from the construction and demolition activities associated with the UTES component of the Proposed Action. Construction and demolition activities would generate air pollutant emissions from site-disturbing activities such as grading, filling, compacting, and trenching and the operation of construction and demolition equipment and haul trucks transporting construction supplies, excavation material, and demolition debris. Construction and demolition activities would also generate particulate emissions as fugitive dust from ground-disturbing activities and from the combustion of fuels in construction and demolition equipment. Fugitive dust emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the work phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction and demolition site is proportional to the area of land being worked and the level of activity. Construction and demolition activities would incorporate BMPs and control measures (e.g., frequent use of water for dust-generating activities) to minimize fugitive particular matter emissions. Additionally, the work vehicles are assumed to be well-maintained and could use diesel particle filters to reduce emissions. Construction and demolition workers commuting daily to and from the job site in their personal vehicles would also result in criteria pollutant air emissions. It is not expected that emissions from construction and demolition activities would contribute to or affect local or regional attainment status with the NAAQS.

Long-term, negligible, adverse effects on air quality would be expected from the operational UTES component activities of the Proposed Action. Day-to-day operations of the proposed UTES and controlled-humidity building would generate air emissions as combustion products from the burning of natural gas in boilers and furnaces to provide comfort heating and the combustion of diesel fuel by an emergency generator to provide back-up electrical power. The new air emissions from the boilers and furnaces to be constructed would be largely offset by the elimination of air emissions from the existing, older boilers and furnaces at the current UTES proposed for demolition. The proposed diesel-fueled emergency generator is anticipated to have approximately 300 kilowatts of electrical output capacity; however, this air quality analysis assumes that this generator would have 1 megawatt of electrical output capacity. This assumption was made should future mission requirements dictate a more emissive generator. The emergency generator also is assumed to be used for 300 hours per year. Unless exempted, the MAARNG might need to obtain a state air quality construction permit for the new boilers/heaters and this emergency generator in accordance with 310 CMR 7.02 through 7.03 and 310 CMR 7.26(42). The UTES component of the Proposed Action would not increase the net number of personnel or vehicles. Therefore, emissions from the existing personnel and vehicles would not change.

Air emissions from the UTES component of the Proposed Action are summarized in **Table 4-2**. **Appendix D** contains detailed calculations and the assumptions used to estimate the air emissions. The total construction and demolition process is anticipated to last for more than 1 year; however, for the purposes of this air quality analysis, construction and demolition is calculated as occurring in only 1 year, 2013. As a result, the emission estimates in this air quality analysis are conservative. Long-term, operating air emissions from the UTES component of the Proposed Action would be produced yearly, beginning in 2014.

## 4.2.3 Effects of the RTI Component

**Emissions Estimates.** Short-term, minor, adverse effects on air quality would be expected from the construction activities associated with the RTI component of the Proposed Action. Construction activities would generate air pollutant emissions from site-disturbing activities such as grading, filling, compacting,

**Table 4-2. Estimated Annual Air Emissions Resulting from the UTES Component of the Proposed Action**

<b>Emissions</b>	<b>NO<sub>x</sub> tpy</b>	<b>VOC tpy</b>	<b>CO tpy</b>	<b>SO<sub>2</sub> tpy</b>	<b>PM<sub>10</sub> tpy</b>	<b>PM<sub>2.5</sub> tpy</b>	<b>CO<sub>2</sub> tpy</b>
Combustion	6.168	0.675	2.667	0.495	0.428	0.415	709.431
Fugitive Dust	-	-	-	-	21.923	2.192	-
Haul Truck On-Road	0.738	0.533	2.168	0.058	0.877	0.228	186.747
Construction Commuter	0.132	0.132	1.190	0.002	0.013	0.008	157.778
<b>Total 2013 Emissions (Construction and Demolition Only)</b>	<b>7.038</b>	<b>1.340</b>	<b>6.024</b>	<b>0.555</b>	<b>23.241</b>	<b>2.844</b>	<b>1,053.956</b>
<b>Percent of MPI AQCR</b>	<b>0.010</b>	<b>0.002</b>	<b>0.001</b>	<b>0.001</b>	<b>0.031</b>	<b>0.021</b>	<b>0.00135*</b>
Emergency Generator	5.463	0.140	1.451	0.003	0.171	0.171	281.690
<b>Total 2014 and Later Emissions</b>	<b>5.463</b>	<b>0.140</b>	<b>1.451</b>	<b>0.003</b>	<b>0.171</b>	<b>0.171</b>	<b>281.690</b>
<b>Percent of MPI AQCR</b>	<b>0.008</b>	<b>&lt; 0.001</b>	<b>&lt; 0.001</b>	<b>&lt; 0.001</b>	<b>&lt; 0.001</b>	<b>0.001</b>	<b>0.00036*</b>

Note: \* Percent of State of Massachusetts's 2009 CO<sub>2</sub> emissions (DOE/EIA 2011).

and trenching and the operation of construction equipment and haul trucks transporting construction supplies and excavation material. Construction activities would also generate particulate emissions as fugitive dust from ground-disturbing activities and from the combustion of fuels in construction equipment. Fugitive dust emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the work phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of activity. Construction activities would incorporate BMPs and control measures (e.g., frequent use of water for dust-generating activities) to minimize fugitive particulate matter emissions. Additionally, the work vehicles are assumed to be well-maintained and could use diesel particle filters to reduce emissions. Construction workers commuting daily to and from the job site in their personal vehicles would also result in criteria pollutant air emissions. It is not expected that emissions from construction activities would contribute to or affect local or regional attainment status with the NAAQS.

Long-term, negligible, adverse effects on air quality would be expected from the operational RTI component activities of the Proposed Action. Day-to-day operation of the RTI buildings would generate air emissions as combustion products from the burning of natural gas in boilers and furnaces to provide comfort heating. To reduce the amount of energy required for heating and, in turn, reduce air emissions from the operation of heating equipment, the proposed RTI buildings would incorporate modern energy-saving features to achieve an energy-efficiency rating of LEED Silver. Based on the relatively small size of the proposed buildings and the use of energy-saving features, the air emissions produced from the operation of the proposed RTI buildings are not quantitatively included in this air quality analysis. Unless exempted, the MAARNG might need to obtain a state air quality construction permit for new boilers/heaters in accordance with 310 CMR 7.02 through 7.03. Other long-term air emissions sources such as emergency electrical generators would not be used at the proposed RTI facilities. The RTI component of the Proposed Action would not increase the net number of personnel or vehicles. Therefore, emissions from the existing personnel and vehicles would not change.

Air emissions from the RTI component of the Proposed Action are summarized in **Table 4-3**. **Appendix D** contains detailed calculations and the assumptions used to estimate the air emissions. The total construction and demolition process is anticipated to last for more than 1 year; however, for the purposes of this air quality analysis, construction and demolition is calculated as occurring in only 1 year, 2014. As a result, the emission estimates in this air quality analysis are conservative. Long-term, operating air emissions from the RTI component of the Proposed Action would be produced yearly, beginning in 2015.

**Table 4-3. Estimated Annual Air Emissions Resulting from the RTI Component of the Proposed Action**

Emissions	NO <sub>x</sub> tpy	VOC tpy	CO tpy	SO <sub>2</sub> tpy	PM <sub>10</sub> tpy	PM <sub>2.5</sub> tpy	CO <sub>2</sub> tpy
Combustion	4.807	0.578	2.119	0.380	0.345	0.335	544.622
Fugitive Dust	-	-	-	-	1.828	0.183	-
Haul Truck On-Road	0.670	0.484	1.969	0.053	0.797	0.207	169.614
Construction Commuter	0.099	0.099	0.892	0.001	0.009	0.006	118.334
<b>Total 2014 Emissions (Construction and Demolition Only)</b>	<b>5.576</b>	<b>1.161</b>	<b>4.980</b>	<b>0.434</b>	<b>2.980</b>	<b>0.731</b>	<b>832.569</b>
<b>Percent of MPI AQCR</b>	<b>0.008</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.004</b>	<b>0.005</b>	<b>0.00106*</b>

Note: \* Percent of State of Massachusetts's 2009 CO<sub>2</sub> emissions (DOE/EIA 2011).

#### 4.2.4 General Conformity, Air Permit Effects, and GHG Analysis from the Proposed Action

**General Conformity.** As stated in **Section 3.2.2**, Barnstable County has been designated as unclassified/attainment for all criteria pollutants except 8-hour O<sub>3</sub>. O<sub>3</sub> is classified as moderate nonattainment. Based on this designation, the General Conformity Rule requirements are potentially applicable for O<sub>3</sub>. **Table 4-4** compares the estimated annual air emissions from the Proposed Action to the *de minimis* threshold limits established for the Barnstable County. For all years, air emissions from the Proposed Action are well below *de minimis* threshold limits; therefore, a General Conformity determination is not required.

**Air Permit Effects.** PSD permit regulations do not apply to the Proposed Action because the MAARNG is not an existing PSD major source and the increase in stationary source emissions is not a PSD major source by itself. In addition, the facility is not located within 10 kilometers of national parks or wilderness areas (i.e., Class I Areas). Nonattainment NSR permit regulations also do not apply to the Proposed Action because the increase in stationary source NO<sub>x</sub> and VOC emissions would not result in MAARNG being classified as a NANSR major source. The Proposed Action would not trigger Title V Operating Permit requirements because the increase in stationary source emissions is very small and the resulting facilitywide potential emissions are not expected to reach the Title V Operating Permit thresholds of 100 tpy for NO<sub>x</sub>, VOC, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and CO. As indicated in **Section 4.2.2**, unless exempted, a state air quality construction permit might need to be obtained from the MassDEP for new boilers/heaters and the UTES emergency generator prior to their construction; refer to 310 CMR 7.02 and 7.03. In addition, regardless of any permit requirement, the generator would be subject to Federal and state air quality operational requirements and the boilers/heaters might also be subject to such requirements.

**Table 4-4. Comparison of Emissions from the Proposed Action to the General Conformity Rule *de minimis* Limits**

Year	NO <sub>x</sub> (tpy)	VOC (tpy)
2013 UTES Emissions (Construction)	7.038	1.340
<b>Total 2013 Emissions</b>	<b>7.038</b>	<b>1.340</b>
2014 RTI Emissions (Construction)	5.576	1.161
2014 and Later UTES Generator Emissions	5.463	0.140
<b>Total 2014 Emissions</b>	<b>11.039</b>	<b>1.301</b>
<b>Total 2015 and Later Emissions</b>	<b>5.463</b>	<b>0.140</b>
General Conformity Rule <i>de minimis</i> Limits for Barnstable County	100	50

**Greenhouse Gas Emissions.** The Proposed Action would contribute directly to emissions of GHGs from the combustion of fossil fuels. Because CO<sub>2</sub> emissions account for approximately 92 percent of all GHG emissions in the United States, they are used for analyses of GHG emissions in this assessment. The U.S. Department of Energy, Energy Information Administration estimates that in 2009 gross CO<sub>2</sub> emissions in the Commonwealth of Massachusetts were 71 million metric tons and in 2009 gross CO<sub>2</sub> emissions in the entire United States were 5,425.6 million metric tons (DOE/EIA 2011).

For 2013 and 2014, the years in which the UTES and RTI would be constructed, construction and demolition activities would emit a total of 1,711.1 metric tons of CO<sub>2</sub> (or 1,886.5 U.S. Tons). These CO<sub>2</sub> emissions would be 0.00241 percent of the Commonwealth of Massachusetts's 2009 CO<sub>2</sub> emissions and 0.00003 percent of the entire United States' 2009 CO<sub>2</sub> emissions. The operation of an emergency electrical generator at the proposed UTES would emit 255.5 metric tons of CO<sub>2</sub> (or 281.7 U.S. tons). CO<sub>2</sub> emissions during 2015 and later would be 0.00036 percent of the Commonwealth of Massachusetts's 2009 CO<sub>2</sub> emissions and 0.000005 percent of the entire United States' 2009 CO<sub>2</sub> emissions. Therefore, the Proposed Action would represent a negligible contribution towards statewide and national GHG inventories.

## 4.2.5 Effects of the No Action Alternative

Under the No Action Alternative, the MAARNG would not implement either component of the Proposed Action. Existing air quality conditions would continue as described in **Section 3.2.2**. No effects would be expected.

## 4.3 Noise

### 4.3.1 Evaluation Criteria

An analysis of the potential effects associated with noise typically evaluates potential changes to the existing acoustical environment that would result from implementation of a proposed action. Potential changes in the acoustical environment can be beneficial (i.e., they reduce the number of sensitive receptors exposed to unacceptable noise levels or reduce the ambient sound level), negligible (i.e., the total number of sensitive receptors to unacceptable noise levels is essentially unchanged), or adverse

(i.e., they result in increased sound exposure to unacceptable noise levels or ultimately increase the ambient sound level).

The main issues concerning noise effects on humans are physiological effects (e.g., hearing loss and non-auditory effects), behavioral effects (e.g., speech or sleep interference and performance effects), and subjective effects such as annoyance. This noise analysis considers potential effects on nearby noise-sensitive receptors, including residential, schools, churches, and hospitals. The major sources of noise, their contribution to the overall noise environment, and maximum sound level were estimated for comparison to Federal and general noise standards. The analysis considers construction and operation of the Proposed Action.

### 4.3.2 Effects of the UTES Component

**Construction Noise.** Short-term, minor, adverse effects on the noise environment would be expected from the UTES component of the Proposed Action. Short-term, minor, adverse effects on the noise environment would be expected from the use of heavy equipment during construction and demolition activities. Noise from construction and demolition activities varies depending on the type of equipment being used, the area that the project would occur in, and the distance from the source. Individual equipment used for demolition and construction activities would be expected to result in noise levels comparable to those shown in **Table 3-4**.

To predict how construction and demolition activities would affect populations, noise from the anticipated construction and demolition types of equipment were estimated. For example, building construction and demolition usually involves several pieces of equipment (e.g., saws and haul trucks) that can be used simultaneously. Cumulative noise from the construction and demolition equipment during the busiest day under the Proposed Action was estimated to determine the total effect of noise from construction activities at a given distance. Noise levels resulting from the Proposed Action were estimated at varying distances as shown in **Table 4-5**. These sound levels were estimated by adding the noise from several pieces of equipment and then calculating the decrease in noise levels at various distances from the source.

**Table 4-5. Estimated Noise Levels from Construction and Demolition Activities**

Distance from Noise Source	Estimated Noise Level
50 feet	90–94 dBA
100 feet	84–88 dBA
150 feet	81–85 dBA
200 feet	78–82 dBA
400 feet	72–76 dBA
800 feet	66–70 dBA
1,200 feet	< 64 dBA

The closest noise-sensitive receptor to the UTES site is the Town of Forestdale, which is approximately 500 feet to the east of the proposed construction and demolition activities. Noise levels would likely reach a maximum of 73 dBA at the border of Forestdale. However, noise generation would last only for the duration of construction activities and could be minimized through the following measures:

- Performing maintenance on the equipment to potentially lessen their noise levels
- Replacing older equipment with newer, quieter equipment

- Using the best available noise-control techniques (i.e., improved mufflers, equipment redesign, intake silencers, ducts, and engine enclosures and noise-attenuating shields or shrouds on all equipment and trucks)
- Using exhaust mufflers on compressed air exhaust
- Placing stationary construction equipment as far from sensitive receptors as possible
- Using acoustical shielding on stationary equipment when feasible.

The construction and demolition activities proposed for the UTES component of the Proposed Action would be implemented at different times during FY 2013. Given the extent of the work activities and the proximity to noise-sensitive populations, short-term, minor, adverse effects from construction and demolition noise would be expected.

Short-term, negligible, adverse effects on the ambient noise environment would be expected as a result of the increase in construction and demolition vehicle traffic. Construction and demolition vehicle traffic would be concentrated on Dolan, Greenway, and Snake Pond roads. The temporary construction traffic would consist of a fraction of existing traffic, and would likely cause negligible increases in noise levels to populations adjacent to the proposed UTES site.

**Implementation Noise.** Long-term, negligible, beneficial effects would be expected from the UTES component of the Proposed Action. As a result of the current lack of adequately sized maintenance areas, certain types of maintenance currently must be conducted outdoors. The proposed UTES facility would provide adequate space to conduct this maintenance indoors, thus reducing the adverse effects on noise from vehicle maintenance.

### 4.3.3 Effects of the RTI Component

**Construction Noise.** Short-term, minor, adverse effects on the noise environment would be expected from the RTI component of the Proposed Action. Construction noise levels are expected to be similar to those discussed in **Section 4.3.2** and shown on **Table 4-5**.

The proposed RTI site is in the vicinity of the existing RTI barracks. Therefore, the RTI barracks could experience noise levels up to 82 dBA.

Additional populations adjacent to the RTI site include the Colonel James P. Lyle Middle School, which is approximately 2,500 feet away and likely would experience a maximum noise level of 59 dBA. Noise generation would last only for the duration of construction activities and could be minimized through measures discussed in **Section 4.3.2**, such as the restriction of these activities to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.) and the use of equipment exhaust mufflers. The construction activities proposed for the RTI component of the Proposed Action would be implemented at different times during FY 2014. Given the extent of the work activities and the proximity to noise-sensitive populations, short-term, minor, adverse effects from construction noise would be expected.

Short-term, negligible, adverse effects on the ambient noise environment would be expected as a result of the increase in construction vehicle traffic under the RTI component of the Proposed Action. Construction traffic would be concentrated on Turpentine and Lee roads and Curtis Boulevard. The temporary construction traffic would be a fraction of the existing traffic, and would likely cause negligible increases in noise levels on populations adjacent to the RTI site.



**Implementation Noise.** No long-term effects on the ambient acoustical environment would be expected from the RTI component of the Proposed Action because there would be no increase in personnel, traffic, or training activities.

#### 4.3.4 Effects of the No Action Alternative

Under the No Action Alternative, the MAARNG would not implement either component of the Proposed Action. Existing noise conditions would continue as described in **Section 3.3.2**. No effects would be expected.

### 4.4 Earth Resources (Geology, Topography, and Soils)

#### 4.4.1 Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating the potential effects of a proposed action on geological resources. Generally adverse effects can be avoided or minimized if proper construction techniques, erosion-control measures, and structural engineering design are incorporated into project development.

Effects on geological resources were assessed by evaluating the following:

- Potential to destroy unique geological features
- Proximity to or effect on geologic hazards (such as locating a proposed action in a seismic zone)
- Potential to affect soil or geological structures that control groundwater quality or groundwater availability
- Alteration of soil structure or function
- Potential for soil erosion.

#### 4.4.2 Effects of the UTES Component

The UTES component of the Proposed Action would result in short- and long-term, negligible, adverse effects on earth resources from soil compaction, erosion, and sedimentation. However, no significant adverse effects would be expected, as construction would not substantially alter the geology of the site, and the soils present on site are previously disturbed. Construction vehicles would compress soils, decreasing permeability and rates of storm water runoff infiltration. Compaction of soils would result in disturbance and modification of soil structure. Soil productivity, which is the capacity of the soil to produce vegetative biomass, would decline in disturbed areas and be eliminated in those areas within the footprint of buildings, pavements, and roadways. Loss of soil structure due to compaction from foot and vehicle traffic could result in changes in drainage patterns but could be mitigated by soil decompaction methods. Soil erosion and sediment control measures would be included in site plans to minimize long-term erosion and sediment production at the site. The site would be constructed with storm water controls favoring methods that allow for storm water to reenter the groundwater system rather than leaving the site as surface flow, as directed by Section 438 of the EISA (MassDEP 2003). Use of storm water control measures that favor reinfiltration in this way would minimize the potential for erosion and sediment production as a result of future storm events.

Long-term, negligible, adverse effects would be expected on the natural topography as a result of site preparation (i.e., grading, excavating, and recontouring). These effects are considered negligible as Camp Edwards is fairly level in elevation and only minor, if any, grading would be anticipated.

Site-specific soil testing would be conducted prior to implementing the Proposed Action to determine if soil limitations exist and to determine appropriate BMPs to offset potentially insignificant adverse effects. BMPs could include installing silt fencing and sediment traps, applying water to disturbed soil, and revegetating disturbed areas as soon as possible after the disturbance, as appropriate. In the event of a release of hazardous materials, the installation's Spill Prevention, Control, and Countermeasures Plan would be followed to quickly contain and clean up the release (see **Section 4.10**). No effects on prime farmland soils would be anticipated.

The areas to be disturbed by the UTES facility of the Proposed Action are already covered by impervious and semi-impervious surfaces and no net change in the amount of impervious and semi-impervious surface would occur from the UTES component of the Proposed Action. Therefore, no adverse effects would be expected.

No short-term effects from radon would be encountered. Long-term, negligible, adverse effects from radon would be encountered in the event that indoor radon testing is conducted and tests indicate that elevated radon concentrations are inside any of the proposed buildings of the Proposed Action. Appropriate mitigation measures, such as installing radon pumps to exhaust vapors outside or installing passive radon systems to lower radon levels, would be required.

#### **4.4.3 Effects of the RTI Component**

Much like the UTES component of the Proposed Action, the RTI component of the Proposed Action would result in short- and long-term, negligible, adverse effects on earth resources from soil compaction, erosion, and sedimentation. No significant adverse effects would be expected, as construction would not substantially alter the geology of the site, and the soils present on site are previously disturbed. Construction of the proposed education building and barracks at the RTI site would result in similar, but more extensive effects on earth resources from soil compaction, erosion, and sedimentation than construction of the UTES facilities. This is due to the need to clear the grassy areas adjacent to the existing parking facilities of vegetation to complete the Proposed Action. The BMPs described for the UTES component of the Proposed Action would be implemented for the RTI component, and the overall effects on earth resources would be negligible.

#### **4.4.4 Effects of the No Action Alternative**

Under the No Action Alternative, the MAARNG would not implement either component of the Proposed Action. Existing earth resource conditions would continue as described in **Section 3.4.2**. No effects would be expected.

### **4.5 Water Resources**

#### **4.5.1 Evaluation Criteria**

Evaluation criteria for effects on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. A proposed action could have significant effects with respect to water resources if any of the following were to occur:

- Substantially reduce water availability or supply to existing users (i.e., groundwater and surface water)
- Overdraw groundwater basins
- Exceed safe annual yield of water supply sources
- Threaten or damage unique hydrologic characteristics
- Violate established laws or regulations adopted to protect water resources
- Substantially adversely affect water quality
- Endanger public health by creating or worsening hazardous health conditions
- Occur in an area with a high probability of flooding.

#### **4.5.2 Effects of the UTES Component**

The UTES component of the Proposed Action would result in short-term, negligible, adverse effects on water resources from the excavation of soils, erosion of disturbed soils, and potential transport of sediment and contaminants during storm water flow events. Ensuring onsite storm water infiltration during construction activities, as required by Section 438 of the EISA, would sustain and recharge groundwater and minimize storm water runoff.

A release of hazardous materials from equipment conducting construction and demolition activities could adversely affect receiving water bodies. In the event of a release, procedures identified in the installation's Spill Prevention, Control, and Countermeasures Plan would be followed to contain and clean up the spill. Implementation of the BMPs identified in the Spill Prevention, Control, and Countermeasures Plan would minimize the potential for and extent of contamination.

No long-term effects on water resources would be expected from the UTES component of the Proposed Action. Though the UTES site was previously developed and no increase in impervious surfaces is expected, soil compaction from construction activities could alter storm water infiltration and increase runoff. The UTES component of the Proposed Action would not occur in a designated 500-year floodplain; therefore, no effects associated with floodplains would be expected. A small increase in demand for potable water would be expected during construction activities, causing short-term, minor effects on drinking water supply. The classification of groundwater resources would not be altered by the UTES component of the Proposed Action.

#### **4.5.3 Effects of the RTI Component**

Effects from the RTI component of the Proposed Action would be similar to, but greater than, those expected from the UTES component. Development of the grassy areas adjacent to the existing parking facilities at the RTI campus would result in vegetation clearing and a slight increase in the area of impermeable surface. The added impermeable surface would result in increased potential for erosion and sedimentation.

Short- and long-term, minor, adverse effects would be expected from the RTI component of the Proposed Action. Vegetation clearing and soil compaction would result in erosion of disturbed soils, transport of sediments and potential pollutants into nearby water bodies during storm water flow events, and alteration of infiltration of storm water into soils. Storm water runoff velocity and volume would increase, and the increase in impervious surfaces would limit groundwater infiltration on site. However, BMPs, as

described for the UTES component of the Proposed Action, would be implemented to minimize the adverse effects, and, therefore, no significant effects would be expected.

The RTI component of the Proposed Action would not occur in a designated floodplain; therefore, no effects associated with floodplains would be expected. A small increase in demand for potable water would be expected during construction activities, causing short-term, minor effects on drinking water supply. The classification of groundwater resources would not be altered by the RTI component of the Proposed Action.

#### **4.5.4 Effects of the No Action Alternative**

Under the No Action Alternative, the MAARNG would not implement either component of the Proposed Action. Existing water resource conditions would continue as described in **Section 3.5.2**. No effects would be expected.

### **4.6 Biological Resources**

#### **4.6.1 Evaluation Criteria**

The evaluation criteria for effects on biological resources is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to proposed activities, and (4) the duration of ecological effects. A habitat perspective is used to provide a framework for analysis of general classes of effects (i.e., removal of critical habitat, disturbance, or noise).

Ground disturbance and noise associated with construction and demolition activities could cause potential effects directly or indirectly on biological resources. Direct effects from ground disturbance were evaluated by identifying the types and locations of potential ground-disturbing activities in correlation to important biological resources. Mortality of individuals, habitat removal, and damage or degradation of habitats might be effects associated with ground-disturbing activities.

Noise associated with a proposed action might be of sufficient magnitude to result in the direct loss of individuals and reduce reproductive output within certain ecological settings. Ultimately, extreme cases of such stresses could have the potential to lead to population declines or local or regional extinction. To evaluate effects, considerations were given to the number of individuals or critical species involved, amount of habitat affected, relationship of the area of potential effect to total available habitat within the region, type of stressors involved, and magnitude of the effects.

#### **4.6.2 Environmental Consequences of UTES Component**

**Vegetation.** Under the UTES component of the Proposed Action, short-term, minor, adverse effects on vegetation would occur as a result of habitat loss and invasive species introduction associated with construction and demolition activities.

In total, no more than 15 acres would be disturbed from the construction of the proposed UTES, demolition of the existing UTES, and the construction of the controlled-humidity building. Because the areas to be disturbed are already covered with pavement and crushed stone and because following construction the amount of concrete and crushed stone surface will be similar to current conditions, no net change in the amount of impervious and semi-impervious surface would be expected and no vegetation would be permanently removed. Construction and demolition activities associated with the UTES

component of the Proposed Action would have short-term, minor, adverse effects on surrounding or adjacent vegetation habitats. Disturbance of grass and shrub species and removal of scattered pitch pine, scrub oak are likely to occur; however, it is expected that vegetation would recover or reestablish following construction and demolition.

Nonnative, invasive plant species have the potential to expand coverages and new species are likely in some areas due to the construction and demolition activities. EO 13112, 1999, directs agencies to prevent the spread of invasive species in their work. BMPs would be implemented during construction to minimize effects on adjacent landscape vegetation. Areas disturbed as a result of project development would be replanted with native vegetation or approved grass seed mixtures following construction and demolition activities. The Natural Resources Office would conduct monitoring of nonnative and invasive species.

**Wildlife.** Under the UTES component of the Proposed Action, short-term, minor, adverse effects on wildlife would occur as a result of temporary disturbances (i.e., noise) and increased vehicle traffic associated with construction and demolition activities. Wildlife would be permanently displaced from the areas where the habitat is cleared for construction and temporarily dispersed from areas adjacent to the project areas during construction periods. Increased mortality of less-mobile species would be expected as the result of unavoidable direct effects associated with construction activities. Vehicle traffic to and from the work site has the potential to cause mortality of fauna. Animals such as deer, raccoons, squirrels, and toads have been documented as vehicle mortalities. Two eastern box turtle road kills were documented between 1994 and 2006 (MAARNG 2009a). BMPs such as allowing wildlife to move out of the path of construction equipment would be implemented during construction to minimize effects on wildlife.

Noise created during construction and demolition activities would result in adverse effects on nearby wildlife. Clearing, grading, paving, and building construction can cause an increase in sound that is well above the ambient level. This would result in reduced communication ranges, interference with predator/prey detection, or habitat avoidance. Prior experience with noise is the most important factor in the response of wildlife because species can become accustomed (or habituate) to it. The rate of habituation to short-term construction is not known. Wildlife residing in the vicinity of the work site would be expected to adapt to the variety of noise levels associated with urban areas and military activities.

**Species of Special Concern.** The site of the UTES component of the Proposed Action does not provide suitable habitat for threatened, endangered or rare species; therefore, no effects are expected to occur.

**Wetlands.** No direct, adverse effects on wetlands would be expected as a result of implementing the UTES component of the Proposed Action. Short-term, minor, indirect, adverse effects on wetlands and waters of the United States would occur as a result of construction and demolition activities. Potential increases in surface runoff due to sheet flow over impervious surfaces and a potential increase in erosion and sedimentation could occur. While not mitigation measures, implementation of properly designed and maintained erosion and sediment controls and storm water management practices during construction would minimize the potential for any adverse effects on wetlands occurring in proximity to the development sites. Implementation of storm water pollution BMPs during and after construction would minimize the potential for adverse effects associated with runoff from the new facilities.

#### 4.6.3 Environmental Consequences of RTI Component

**Vegetation.** Under the RTI component of the Proposed Action, short-term, minor, adverse effects on vegetation would occur as a result of habitat loss, invasive species introduction associated with construction activities, and an increase in impervious surfaces.

The site of the RTI component of the Proposed Action consists of approximately half pavement from a parking lot and half manicured grass within a previously disturbed area. Long-term, minor, adverse effects would occur from the permanent removal of grass within the footprint for development. Short-term, minor adverse effects on adjacent landscape vegetation would occur from the temporary removal of adjacent grasses and shrubs during construction.

Nonnative, invasive plant species have the potential to expand coverages and new species are likely in some areas due to the construction activities. BMPs would be implemented during construction to minimize effects on adjacent landscape vegetation. Areas temporarily disturbed as a result of project development would be replanted with native vegetation or approved grass seed mixtures following construction activities.

The proposed RTI buildings would be partially constructed on the grass areas to the north and south of the existing parking lot. This placement would result in an increase in impervious surfaces that would exceed the EISA Section 438 threshold of 5,000 ft<sup>2</sup>. Consequently, the proposed project would be designed to ensure no net increase in storm water run-off from the site. Furthermore, implementation of storm water pollution BMPs during and after construction would minimize the potential for adverse effects associated with runoff from the new facilities and impervious surfaces.

**Wildlife.** Under the RTI component of the Proposed Action, short-term, negligible, adverse effects on wildlife would occur as a result of temporary noise disturbances and increased human activity associated with construction activities. Wildlife would be permanently displaced from the areas where the habitat is cleared for construction and temporarily dispersed from areas adjacent to the project areas during construction periods. Increased mortality of less-mobile species would be expected as the result of unavoidable direct effects associated with construction activities. Effects on wildlife would be insignificant due to the developed nature of the RTI site and the limited wildlife present.

Noise created during construction activities would result in adverse effects on nearby wildlife. Clearing, grading, paving, and building construction can cause an increase in sound that is well above the ambient level. This would result in reduced communication ranges, interference with predator/prey detection, or habitat avoidance. Prior experience with noise is the most important factor in the response of wildlife because species can become accustomed (or habituate) to it. The rate of habituation to short-term construction is not known. Wildlife residing in the vicinity of the work site would be expected to adapt to the variety of noise levels associated with urban areas and military activities.

**Species of Special Concern.** The site of the RTI component of the Proposed Action does not provide suitable habitat for threatened, endangered, and rare species; therefore, no effects are expected to occur.

**Wetlands.** No effects on wetlands or waters of the United States would be expected as a result of implementing the RTI component of the Proposed Action. There are no wetlands at or adjoining the site of the proposed RTI buildings.

#### **4.6.4 Environmental Consequences of No Action Alternative**

Under the No Action Alternative, the MAARNG would not implement either component of the Proposed Action. Existing biological resource conditions would continue as described in **Section 3.6.2**. No effects would be expected.

### **4.7 Cultural Resources**

#### **4.7.1 Evaluation Criteria**

Adverse effects on cultural resources include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; and indirect effects, such as introducing visual or audible elements that are out of character with the property or that alter its setting. The general neglect of the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of the agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance can also create adverse effects.

#### **4.7.2 Effects of the UTES Component**

No effects on cultural resources under NEPA would occur as a result of the UTES component of the Proposed Action. For the purpose of this EA, the Area of Potential Effect (APE) for archaeological resources under the UTES component of the Proposed Action is defined by the limits of the proposed construction footprint for the proposed UTES building, controlled-humidity building, and associated infrastructure (parking, perimeter fencing, and access roads). Based on data provided in the MAARNG Integrated Cultural Resources Management Plan (ICRMP) (MAARNG 2009b), the cantonment area of Camp Edwards, which includes the APE, has been determined to have no potential for preservation of intact archaeological deposits. The Massachusetts Historical Commission has provided concurrence on this determination. As such, the UTES component of the Proposed Action is not expected to affect archaeological resources. In the event that archaeological materials are inadvertently discovered during construction activities, the MAARNG would follow the procedures outlined in Standard Operating Procedure (SOP) 5 in the installation's ICRMP (MAARNG 2009b).

For the purposes of this EA, the APE for effects on architectural resources is limited to the buildings within the former BOMARC Missile Complex. The existing UTES building proposed for demolition was constructed in 1962 and would be at least 50 years of age at the time of its proposed demolition. This building and associated complex was determined not eligible for listing in the NRHP by the Massachusetts Historical Commission in 1999, due to insufficient physical integrity (MAARNG 2001). There are no NRHP eligible or unevaluated buildings within the proposed APE. As such, the UTES component of the Proposed Action has no potential to effect historic properties.

For the purpose of this EA, the APE for effects on resources of traditional, religious, or cultural significance to Native American tribes under the UTES component of the Proposed Action is defined by the limits of the proposed construction footprint for the proposed UTES building, controlled-humidity building, and associated infrastructure (parking, perimeter fencing, and access roads). The MAARNG has consulted with the Mashpee Wampanoag Tribe, and this consultation has determined that there are no resources of traditional, religious, or cultural interest to the tribe within or near the APE. Therefore, the UTES component of the Proposed Action is not expected to affect resources of traditional, religious, or cultural interest to Native American tribes. In the event that human remains or items of cultural



patrimony are inadvertently discovered during construction activities, the MAARNG would follow the procedures outlined in SOP 5 of the ICMRP.

#### 4.7.3 Effects of the RTI Component

No effects on cultural resources under NEPA would occur as a result of the RTI component of the Proposed Action. For the purpose of this EA, the APE for archaeological resources under the RTI component of the Proposed Action is defined by the limits of the proposed construction footprint for the proposed RTI buildings and associated infrastructure (parking, sidewalks, and curbing). Based on data provided in the MAARNG ICRMP (MAARNG 2009b), the cantonment area of Camp Edwards, which includes the APE, has been determined to have no potential for preservation of intact archaeological deposits. As such, the RTI component of the Proposed Action has no potential to effect archaeological resources. In the event that archaeological materials are inadvertently discovered during construction activities, the MAARNG would follow the procedures outlined in SOP 5 in the ICRMP.

For the purposes of this EA, the APE for effects on architectural resources is limited to the buildings within the 5200 Area. Building 5222 and the other adjacent buildings were constructed in 1958. These buildings were determined not eligible for listing in the NRHP, as a result of the Cold War-era building survey (MAARNG 2009b). There are no NRHP eligible or unevaluated buildings within the APE that are within the viewshed of the proposed facilities. As such, the RTI component of the Proposed Action has no potential to effect historic buildings.

For the purpose of this EA, the APE for effects on resources of traditional, religious, or cultural significance to Native American tribes is defined by the limits of the proposed construction footprint for the proposed RTI buildings and associated infrastructure (parking, sidewalks, and curbing). No resources of traditional, religious, or cultural interest have been identified within the APE. Therefore, the UTES component of the Proposed Action has no potential to effect resources of traditional, religious, or cultural interest to Native American tribes. In the event that human remains or items of cultural patrimony are inadvertently discovered during construction activities, the MAARNG will follow the procedures outlined in SOP 5 of the ICMRP.

#### 4.7.4 Effects of the No Action Alternative

Under the No Action Alternative, the MAARNG would not implement either component of the Proposed Action. Existing cultural resource conditions would continue as described in **Section 3.7.2**. No effects would be expected.

### 4.8 Socioeconomic Resources and Environmental Justice

#### 4.8.1 Evaluation Criteria

**Socioeconomics.** The significance of socioeconomic effects is assessed in terms of direct and indirect effects on the local economy and related effects on other socioeconomic resources (e.g., income, housing, and employment). The magnitude of potential effects can vary greatly, depending on the location of a proposed action. For example, implementation of an action that creates 10 employment positions might be unnoticed in an urban area, but could have significant effects in a rural community. If potential socioeconomic changes were to result in substantial shifts in population trends or regional spending and earning patterns, they would be considered significant.

**Environmental Justice.** Ethnicity and poverty data are examined for the ROI and compared to state and national statistics to determine if a low-income or minority population could be disproportionately affected by the Proposed Action. This section also evaluates effects from the Proposed Action on children's environmental health and safety risks.

#### 4.8.2 Effects of the UTES Component

**Socioeconomics.** No effects on population would be anticipated during construction and operation of the UTES component of the Proposed Action. Construction workers would likely be existing local residents. As of 2010, approximately 8.7 percent of the workforce of the socioeconomics ROI was employed in the construction industry. Therefore, there should be sufficient local workers available for the construction activities. There would be no long-term change in the number of personnel or trainees assigned to Camp Edwards.

Short-term, minor, beneficial effects on the local economy of the socioeconomics ROI would be expected during construction of the UTES component of the Proposed Action. The estimated cost of the construction and demolition activities would be \$22 million (MAARNG 2012). The proposed construction activities would stimulate the local economy through increased wages paid, supplies purchased, and taxes generated. Short-term increases in local business volume within the local economy during construction would also be expected due to the provision of construction materials, supplies, and other related services. Because the construction aims for LEED silver certification, there is an incentive to procure and use regional materials; therefore, this benefit is likely to be felt locally. The effects of the construction activities would be temporary and occur during FY 2013.

No long-term effects on the local economy would be expected due to operation of the UTES component of the Proposed Action. Supplies and services purchased for the proposed UTES and controlled-humidity building would be similar to those purchased under existing conditions, and there would be no change in the number of personnel or trainees assigned to Camp Edwards.

**Environmental Justice.** There would be no environmental justice effects associated with the UTES component of the Proposed Action. As previously mentioned, the ROI does not have disproportionately high percentages of residents that are low-income, minority, or under 5 years old. Therefore, other effects associated with the Proposed Action, such as traffic and construction noise, would not disproportionately affect children, or low-income and minority populations.

#### 4.8.3 Effects of the RTI Component

**Socioeconomics.** No effects on population would be anticipated during construction and operation of the RTI component of the Proposed Action. Construction workers would likely be existing local residents. As of 2010, approximately 8.7 percent of the workforce of the socioeconomics ROI was employed in the construction industry. Therefore, there should be sufficient local workers available for the construction activities. There would be no long-term change in the number of personnel or trainees assigned to Camp Edwards.

Short-term, minor, beneficial effects on the local economy of the socioeconomics ROI would be expected during construction of the RTI component of the Proposed Action. The estimated cost of all the construction activities would be \$18,962,000 (MAARNG 2012). The proposed construction activities would occur during FY 2014 and would stimulate the local economy through increased wages paid, supplies purchased, and taxes generated. Short-term increases in local business volume within the local economy during construction would also be expected due to the provision of construction materials, supplies, and other related services. Because the construction aims for LEED silver certification, there is

an incentive to procure and use regional materials; therefore, this benefit is likely to be felt locally. The effects of the construction activities would be temporary and occur during FY 2014.

No long-term effects on the local economy would be expected due to operation of the RTI component of the Proposed Action. Supplies and services purchased for the proposed RTI education building and barracks would be similar to those purchased under existing conditions, and there would be no change in the number of personnel or trainees assigned to Camp Edwards.

**Environmental Justice.** There would be no environmental justice effects associated with the RTI component of the Proposed Action. As previously mentioned, the ROI does not represent a disproportionately low-income or minority population. The ROI does not have a disproportionately high percent of the population under 5 years old. Therefore, any other environmental effects associated with the Proposed Action, such as traffic and construction noise, would not disproportionately affect children, low-income, or minority populations.

#### 4.8.4 Effects of the No Action Alternative

Under the No Action Alternative, the MAARNG would not implement either component of the Proposed Action. Existing socioeconomic and environmental justice resource conditions would continue as described in **Section 3.8.2**. No effects would be expected.

### 4.9 Infrastructure

#### 4.9.1 Evaluation Criteria

Effects on infrastructure are evaluated based on their potential for disruption, excessive use, or improvement of the existing level of service for transportation systems, utilities, and solid waste management. Effects might arise from physical changes to utility needs created by either direct or indirect changes related to the Proposed Action. Assessing effects on utilities entails a determination of utilities that would be used or improved as a result of the Proposed Action. An effect on infrastructure would be significant if the Proposed Action resulted in the following effects:

- Exceeded capacity of a utility or transportation artery
- A long-term interruption of the utility or transportation artery
- A violation of a permit condition
- A violation of an approved plan for that utility.

#### 4.9.2 Effects of the UTES Component

The Proposed Action would not result in short-term or long-term, significant, adverse effects on the installation's infrastructure. In addition, all new construction would be designed to achieve LEED Silver certification. This would promote the minimizing of the facilities' electricity, natural gas, and water consumption, and the optimization of construction waste management and storm water management techniques.

**Transportation Systems.** The UTES component of the Proposed Action would be expected to result in short-term, minor, direct, adverse effects on the transportation network due to increased traffic and parking lot use associated with demolition and construction equipment and contractor vehicles. The construction and demolition activities of the UTES component would require delivery of materials to, and removal of debris from, demolition and construction sites. Construction and demolition traffic would

compose a small percentage of the total existing traffic on the installation. Many of the heavy construction vehicles would be driven to the site and kept on site for the duration of construction and demolition activities, resulting in relatively few additional trips. Most construction and demolition traffic would access the installation through the Bourne Gate, which directly connects to State Highway 28. Construction and demolition traffic would avoid any residential neighborhoods to the maximum extent practicable. The demolition of Building 4601 and the construction of the proposed controlled-humidity building would occur after the construction of the proposed UTES. Therefore, any potential increases in traffic volume associated with the proposed demolition and construction activities would be temporary.

No long-term, adverse effects on traffic systems would be expected to result from the UTES component of the Proposed Action. There would be no increase in full or part-time personnel associated with the UTES component; therefore, there would be no long-term effects on the transportation systems at Camp Edwards or the MMR. Vehicle access to the proposed UTES project areas would be from the south using Dolan Road. Secondary access roads from the west would provide direct access to the installation's training areas, wash-rack, and fuel station. The new UTES facility would be surrounded by a perimeter fence; therefore, both entrances would be accessed via a security gate. The entrances have been positioned to only facilitate authorized visitors.

**Electrical Supply.** The UTES component of the Proposed Action would be expected to result in short-term, negligible, adverse effects on the electrical system during construction and demolition activities. Short-term electrical interruptions could be experienced when buildings are disconnected from, or connected to, the existing electrical distribution system. The potential disruption of electrical services would be temporary and coordinated with area users prior to disconnection. All utilities are already available to the area surrounding the proposed controlled-humidity building and would be extended to the proposed UTES facility.

The UTES component of the Proposed Action would be expected to result in long-term, minor, indirect, beneficial effects on the electrical system by demolishing the existing UTES facility, which has with outdated electrical systems, and constructing a new UTES facility with new energy efficient features.

The UTES component of the Proposed Action would be expected to result in long-term, minor, adverse effects on the electrical system due to the increase in electrical demand from the increased building space of Camp Edwards. The new UTES facility would be 49,044 ft<sup>2</sup> while the existing UTES is only about 25,200 ft<sup>2</sup>. The approximately 20,000-ft<sup>2</sup> controlled-humidity building would further increase the energy consumption. However, this adverse effect would be minimized because the proposed facilities would aim for LEED Silver certification, which would increase energy efficiency (reducing electricity demand) and potentially influence the source (green renewable) of electricity.

**Natural Gas System.** The UTES component of the Proposed Action would be expected to result in short-term, negligible, direct, adverse effects on the natural gas system during demolition and construction activities. Short-term interruptions could be experienced when buildings are disconnected from or connected to the existing natural gas distribution system. However, the discontinuation of natural gas services would be temporary and coordinated with area users prior to disconnection. All utilities are already available to the area surrounding the proposed controlled-humidity building and would be extended to the proposed UTES facility.

Long-term, minor, direct, adverse effects on the natural gas system would be expected due to the increase in building space, and hence heating needs, of Camp Edwards. The proposed UTES facility would be 49,044 ft<sup>2</sup> and the existing UTES is about 25,200 ft<sup>2</sup>. The proposed 20,000-ft<sup>2</sup> humidity-controlled building would further increase natural gas consumption. The UTES component of the Proposed Action would result in a minor increase in natural gas demands at the installation. For every ft<sup>2</sup> of building

space, an estimated 55 cubic feet of natural gas can be consumed per year. Based on this estimation, the existing UTES consumes approximately 1,386,000 cubic feet per year and the proposed UTES and controlled-humidity building together would consume approximately 3,797,420 cubic feet per year. Therefore, an estimated increase of 2,411,420 cubic feet per year of natural gas would be expected due to the UTES component of the Proposed Action. This increase would not be expected to exceed capacity. However, this may be offset to some degree because the LEED Silver certification of the proposed construction projects would likely make heating these buildings as efficient as possible.

**Liquid Fuel Supply.** The UTES component of the Proposed Action would be expected to result in short-term, negligible, adverse effects on the liquid fuel supply due to the minimal amounts of petroleum that would be required for construction and demolition equipment. The required petroleum would be brought on site by contractors and removed when construction activities are complete. No fuel storage tanks or distribution systems would be disrupted during the construction and demolition. The Proposed Action would not involve any fuel system upgrades. Long-term, negligible, adverse effects would result from the addition of one diesel-fueled emergency electrical generator that would be installed adjacent to the proposed UTES facility to provide a backup supply of electrical power.

**Water Supply System.** The UTES component of the Proposed Action would be expected to result in short-term, negligible, adverse effects on the water supply system. Short-term interruptions could be experienced when buildings are disconnected from or connected to the Otis ANG Base water supply system. Water supply is available in all areas associated with the UTES component of the Proposed Action. Work on the components of the water supply system could result in temporary disruptions but would be coordinated with area users prior to starting the work. All utilities are already available to the area surrounding the proposed controlled-humidity building and would be extended to the proposed UTES facility.

Water necessary for construction would be obtained from the Otis ANG Base water supply system. An estimated 500 gallons per acre per day could be used for dust suppression during construction activities. The UTES component of the Proposed Action would involve about 1.9 acres of construction, resulting in about 950 gallons of water per day. This is negligible compared to the average of 333,222 gallons per day that the Otis ANG Base water supply system used in FY 2011 and the 540,000 gallons per day that the J-well is authorized to withdraw. In addition, the Otis ANG Base water supply system is far below capacity. Therefore, construction water needs would be limited and have little effect on the installation's water supply system.

The proposed LEED Silver construction design would have long-term, beneficial effects on the water supply system because it would increase water efficiency.

**Sanitary Sewer and Wastewater Systems.** The UTES component of the Proposed Action would be expected to result in short-term, negligible, adverse effects on the sanitary sewer and wastewater systems. Short-term interruptions could be experienced when buildings are disconnected from, or connected to, the sanitary sewer and wastewater systems. Sanitary sewer service is available in the proposed UTES project areas. Work on components of the sanitary sewer and wastewater system would be temporary and coordinated with area users prior to starting the work.

The UTES component of the Proposed Action would be expected to result in long-term, negligible, beneficial effects on the sanitary sewer and wastewater systems due to the increase in water use efficiency associated with LEED certification. The sanitary sewer and wastewater treatment plant are already operating well within current capacity.

**Storm Water System.** The UTES component of the Proposed Action would be expected to result in short-term, negligible, adverse effects on the storm water system due to the temporary disturbance of the storm water systems during construction and demolition activities. However, this disturbance would be minimized because all LEED-certified projects must prevent soil erosion, waterway sedimentation, and excessive dust generation during construction activity.

Long-term, minor, beneficial effects would be possible because storm water design associated with the LEED Silver certification might improve storm water management. The LEED certification points system incorporates sustainable storm water management techniques (i.e., rate reduction, quantity reduction, and treatment increase).

No long-term adverse effects on storm water systems would be expected. The areas that would be disturbed by the UTES component of the Proposed Action are already covered by pavement and crushed stone and no net change in the amount of impervious and semi-impervious surface would occur.

The proposed UTES facility would exhibit efficient storm water management features. The storm water system would include buried mains, aboveground swales, and detention basins and ponds. Therefore, there would be no adverse effects expected on storm water discharge. All construction sites disturbing more than 1 acre and industrial sites are required to obtain and meet the requirements of the NPDES permit coverage. The discharge of storm water runoff from construction activities at Camp Edwards must be authorized by a construction water permit issued by the USEPA in accordance with the *General Permit for Storm Water Discharges from Construction Activities* (i.e., CGP). The permit requires the development and implementation of a construction-specific Storm Water Pollution Prevention Plan (SWPPP) for construction activities at a site totaling 1 acre or more and where storm water discharges from the construction area enter a municipal separate storm sewer system that leads to natural drainage channels or streams classified as surface waters of the United States. The proposed storm water drainage systems associated with the UTES component of the Proposed Action would be designed to comply with current state and local regulations.

Because this is a Federal project, it would involve the use of low-impact development strategies to comply with EISA Section 438.

Revisions to 310 CMR 10.00 encourage storm water recharge, low-impact development, storm water BMPs, and the removal of illicit connections from storm water management systems (MassDEP undated b).

**Communications.** The UTES component of the Proposed Action would be expected to result in short-term, negligible, adverse effects on the communications systems at Camp Edwards. Short-term interruptions could be experienced when buildings are disconnected from and connected to the communications systems. However, work on the communications systems would be temporary and coordinated with area users prior to the start of work activities. All necessary communication utilities are already available to the area surrounding the proposed controlled-humidity building and would be extended to the proposed UTES facility.

No long-term effects on the communications systems would be expected because the UTES component of the Proposed Action would not involve any communication upgrades or increase in usage.

**Solid Waste Management.** The UTES component of the Proposed Action would be expected to result in short-term, minor, direct, adverse effects from increased construction and demolition debris production. Solid waste generated from the proposed construction and demolition activities would consist of building materials such as solid pieces of concrete, metals (e.g., conduit, piping, and wiring), and lumber.

Contractors would be required to recycle construction and demolition debris to the maximum extent practicable in accordance with installation policy, thereby diverting it from landfills. In addition, the LEED certification process promotes sustainable construction waste management (e.g., landfill diversion and reuse).

The contractor would dispose of non-recyclable construction and demolition debris at an offsite permitted landfill facility, which would have a long-term, negligible, adverse effect on solid waste management by permanently using landfill capacity. The long-term quantity of solid waste generated would be similar to existing levels because the number of personnel and types of activities would remain the same.

As indicated in **Table 4-6**, approximately 2,148 tons of construction debris would be generated over approximately 2 years from implementing the UTES component of the Proposed Action. This effect would be considered minor because it is well within the solid waste management capacity of Camp Edwards. Clean demolition and construction debris (e.g., concrete, asphalt) would be ground, recycled, and used for fill and roadwork rather than disposed of in a landfill, which would also help meet some LEED requirements.

**Table 4-6. Anticipated Generation of Construction and Demolition Debris Associated with the UTES Component of the Proposed Action**

Proposed Activities	Project Size (ft <sup>2</sup> )	Multiplier (pounds/ft <sup>2</sup> )	Total Waste Generated	
			Pounds	U.S. Tons
Demolition	25,200	158	3,981,600	1,991
Construction	69,044	4.34	299,651	150
Pavement Construction	91,808	1	91,808	46
<b>Total</b>				<b>2,187</b>

Source: USEPA 2003

**Pollution Prevention.** It is anticipated that the UTES component of the Proposed Action would not affect the Pollution Prevention Program at Camp Edwards. The construction and demolition activities would take the proper pollution prevention measures stipulated by the Pollution Prevention Plan and take the further precautions stipulated in the LEED certification requirements. The installation's Pollution Prevention Plan aims to minimize waste and meet the requirements of the State Wide Solid Waste Management Plan as well as all applicable Federal, state, and local laws.

### 4.9.3 Effects of the RTI Component

The RTI component of the Proposed Action would not result in short-term or long-term, significant, adverse effects on the installation's infrastructure. In addition, all new construction would be designed to achieve LEED Silver certification. This would promote the minimizing of the buildings' electricity, natural gas, and water consumption and the optimization of construction waste management and storm water management techniques.

**Transportation Systems.** The RTI component of the Proposed Action would be expected to result in short-term, minor, adverse effects on the transportation network due to increased traffic and parking lot use associated with construction equipment and contractor vehicles. The construction activities of the RTI component of the Proposed Action would require delivery of materials to, and removal of debris from, construction sites. Construction traffic would compose a small percentage of the total existing traffic on the installation. Many of the heavy construction vehicles would be driven to the site and kept



on site for the duration of construction activities, resulting in relatively few additional trips. Most construction traffic would access the installation through the Bourne Gate, which directly connects to State Highway 28. Construction traffic would avoid any residential neighborhoods to the maximum extent practicable. Any potential increases in traffic volume associated with the proposed construction activities would be temporary.

Long-term, minor, adverse effects on traffic systems would be expected to result from the RTI component of the Proposed Action. Approximately 30 automobile parking spaces and 7 bus parking spaces would be permanently lost from construction. The loss of these parking spaces would leave 142 car spaces and no bus parking spaces at the RTI campus. There would be no increase in full- or part-time personnel associated with the RTI component of the Proposed Action; therefore, the loss of these parking spaces would be insignificant.

**Electrical Supply.** The RTI component of the Proposed Action would be expected to result in short-term, negligible, adverse effects on the electrical system during construction activities. Short-term electrical interruptions could be experienced when buildings are disconnected from, or connected to, the existing electrical distribution system. However, the disruption of electrical services would be temporary and coordinated with area users prior to disconnection. All utilities are already available to the area surrounding the proposed facilities.

The RTI component of the Proposed Action would be expected to result in long-term, minor, adverse effects on the electrical system due to the increase in electrical demand from the increased building space of Camp Edwards. The new education building would be 25,913 ft<sup>2</sup> and the proposed barracks would be about 32,125 ft<sup>2</sup>. However, this adverse effect would be minimized because all of the proposed construction aims for LEED Silver certification, which would increase energy efficiency (reducing electricity demand) and potentially influence the source (green renewable) of electricity.

**Natural Gas System.** The RTI component of the Proposed Action would be expected to result in short-term, negligible, adverse effects on the natural gas system during construction activities. Short-term interruptions could be experienced when buildings are connected to the existing natural gas distribution system. However, the discontinuation of natural gas services would be temporary and coordinated with area users prior to disconnection. Natural gas utilities are already available to the area surrounding the proposed facilities.

Long-term, minor, adverse effects on the natural gas system would be expected due to the increase in building space, and, hence, the heating needs, of Camp Edwards. The new education building would be 25,913 ft<sup>2</sup> and the proposed barracks would be about 32,125 ft<sup>2</sup>. The RTI component of the Proposed Action would result in a minor increase in natural gas demands at the installation. For every ft<sup>2</sup> of building space, an estimated 55 cubic feet of natural gas can be consumed per year. Based on this estimation, the proposed barracks and education building together would consume approximately 3,192,090 cubic feet per year. This increase would not be expected to exceed capacity. However, this might be offset to some degree because the LEED Silver certification of the proposed construction projects would likely make heating these buildings as efficient as possible.

**Liquid Fuel Supply.** The RTI component of the Proposed Action would be expected to result in short-term, negligible, adverse effects on the liquid fuel supply due to the minimal amounts of petroleum that would be required for construction equipment. The required petroleum would be brought on site by contractors and removed when construction activities are complete. No fuel storage tanks or distribution systems would be disrupted during the construction.

No long-term effects on the liquid fuel supply would be expected because the RTI component of the Proposed Action would not involve any fuel system upgrades or reduction in fuel supply.

**Water Supply System.** The RTI component of the Proposed Action would be expected to result in short-term, negligible, adverse effects on the water supply system. Short-term interruptions could be experienced when buildings are connected to the Otis ANG Base water supply system. Water supply is available in close proximity to the proposed RTI project areas. Work on components of the water supply system could result in temporary disruptions but would be coordinated with area users prior to starting the work.

The RTI component of the Proposed Action would involve about 1.4 acres of construction, resulting in about 700 gallons of water per day. This is negligible compared to the average of 333,222 gallons per day that the Otis ANG Base water supply system used in FY 2011 and the 540,000 gallons per day that the J-well is authorized to withdraw. In addition, the Otis ANG Base water supply system is far below capacity. Therefore, construction water needs would have little effect on the installation's water supply system.

The proposed LEED Silver construction design would have long-term, beneficial effects because it would increase water efficiency and reduce potable water usage.

**Sanitary Sewer and Wastewater Systems.** The RTI component of the Proposed Action would be expected to result in short-term, negligible, adverse effects on the sanitary sewer and wastewater systems. Short-term interruptions could be experienced when buildings are connected to the sanitary sewer and wastewater systems. Sanitary sewer service is immediately adjacent to the proposed RTI project areas. Work on components of the sanitary sewer and wastewater systems would be temporary and coordinated with area users prior to starting the work.

Long-term, negligible, beneficial effects on the sanitary sewer and wastewater system would be expected due to the increase in water use efficiency associated with LEED certification. The sanitary sewer and wastewater treatment plant are already operating well within current capacity.

**Storm Water System.** The RTI component of the Proposed Action would be expected to result in short-term, negligible, adverse effects due to temporary disturbance of the storm water system during construction activities. However, this disturbance would be minimized because all LEED certified projects must prevent soil erosion, waterway sedimentation, and excessive dust generation during construction activity.

Long-term, minor, direct, beneficial effects would be possible because storm water design associated with the LEED Silver certification might improve storm water management. The LEED certification points system incorporates sustainable storm water management techniques (i.e., rate reduction, quantity reduction, and treatment increase).

Long-term, negligible, adverse effects on the storm water system would be expected due to the negligible increase in impervious surface. The new education building would be 25,913 ft<sup>2</sup> and the proposed barracks would be about 32,125 ft<sup>2</sup>. In addition, 1,350 ft<sup>2</sup> of new concrete paving and 300 linear feet of new curbs would be constructed to reconfigure the parking area. However, the proposed barracks would be constructed partially on the southern portion of the existing RTI parking area and partially on the grass area immediately to the south of the parking lot.

All construction sites disturbing more than 1 acre and industrial sites are required to obtain and meet the requirements of the NPDES permit coverage. The discharge of storm water runoff from construction activities at Camp Edwards must be authorized by a construction water permit issued by the USEPA in accordance with the *General Permit for Storm Water Discharges from Construction Activities* (i.e., CGP). The permit requires the development and implementation of a construction-specific SWPPP for construction activities at a site totaling 1 acre or more and where storm water discharges from the

construction area enter a municipal separate storm sewer system that leads to natural drainage channels or streams classified as surface waters of the United States. The proposed storm water drainage systems associated with the RTI component of the Proposed Action would be designed to comply with current state and local regulations.

Because this is a Federal project, it would involve the use of low-impact development strategies to comply with EISA Section 438.

Revisions to 310 CMR 10.00 encourage storm water recharge, low-impact development, storm water BMPs, and the removal of illicit connections from storm water management systems (MassDEP undated b).

**Communications.** The RTI component of the Proposed Action would be expected to result in short-term, negligible, adverse effects on the communications systems at Camp Edwards. Short-term interruptions could be experienced when buildings are connected to the communications systems. However, work on the communications systems would be temporary and coordinated with area users prior to the start of work activities. Communications utilities are already immediately adjacent to the area surrounding the proposed facilities.

No long-term effects on the communications systems would be expected because the RTI component of the Proposed Action does not involve any communication upgrades or increase in usage.

**Solid Waste Management.** The RTI component of the Proposed Action would be expected to result in short-term, minor, direct, adverse effects from construction debris production. Solid waste generated from the proposed construction activities would consist of building materials such as solid pieces of concrete, metals (e.g., conduit, piping, and wiring), and lumber. Contractors would be required to recycle construction debris to the maximum extent practicable in accordance with installation policy, thereby diverting it from landfills. In addition, the LEED certification process promotes sustainable construction waste management (e.g., landfill diversion and reuse).

The contractor would dispose of non-recyclable construction debris at an offsite permitted landfill facility, which would have a long-term, negligible, adverse effect on solid waste management by permanently using landfill capacity. The long-term quantity of solid waste generated would be similar to existing levels because the number of personnel and types of activities would remain the same.

As indicated in **Table 4-7**, the RTI component of the Proposed Action would generate approximately 129.7 tons of construction debris. Clean construction debris (e.g., concrete, asphalt) would be ground, recycled, and used for fill and roadwork rather than disposed of in a landfill, which would meet some LEED requirements for construction.

**Table 4-7. Anticipated Generation of Construction Debris Associated with the RTI Component of the Proposed Action**

Proposed Activity	Project Size (ft <sup>2</sup> )	Multiplier (pounds/ft <sup>2</sup> )	Total Waste Generated	
			Pounds	U.S. Tons
Construction	59,388	4.34	257,744	129
Pavement Construction	1,350	1	1,350	0.7
<b>Total</b>				<b>129.7</b>

Source: USEPA 2003

**Pollution Prevention.** It is anticipated that the RTI component of the Proposed Action would not affect the Pollution Prevention Program at Camp Edwards. The construction activities would take the proper pollution prevention measures stipulated by the Pollution Prevention Plan and take the further precautions stipulated in the LEED certification requirements. The installation's Pollution Prevention Plan aims to minimize waste and meet the requirements of the State Wide Solid Waste Management Plan and all applicable Federal, state, and local laws.

#### 4.9.4 Effects of the No Action Alternative

Under the No Action Alternative, the MAARNG would not implement either component of the Proposed Action. Existing infrastructure resource conditions would continue as described in **Section 3.9.2**. No effects would be expected

### 4.10 Hazardous Materials and Wastes

#### 4.10.1 Evaluation Criteria

Effects on hazardous materials and wastes were assessed by evaluating the degree to which the Proposed Action could cause worker, resident, or visitor exposure to hazardous materials or wastes; whether the Proposed Action would lead to noncompliance with applicable Federal and MassDEP regulations or increase the amounts generated or procured beyond current waste management procedures and capacities; and whether the Proposed Action would disturb an IRP site or create/contribute to an IRP site resulting in adverse effects on human health or the environment.

#### 4.10.2 Effects of the UTES Component

**Hazardous Materials and Petroleum Products.** The UTES component of the Proposed Action would result in short-term, minor, direct, adverse effects on hazardous materials and petroleum products during the demolition and construction period. Hazardous materials and petroleum products at the existing UTES would be moved to the proposed UTES. The use of hazardous materials in construction and demolition equipment would be in accordance with practices established at the MAARNG. Contractors would be responsible for the management of hazardous materials in accordance with the MAARNG Hazardous Material and Waste Management Plan and all Federal and state regulations. BMPs would be followed to ensure that contamination from a spill does not occur. If, however, a POL spill occurs, the ICP outlines the appropriate measure for spill situations.

Most construction practices do not involve substantial uses of hazardous materials. Hazardous materials used in construction activities include solvents, sealants, adhesives, and welding gases; and POL to operate equipment.

The UTES component of the Proposed Action would result in long-term, negligible, direct, adverse effects on hazardous materials and petroleum products during the full occupancy period. There would be no new hazardous or toxic substances used or stored at the proposed UTES facilities. Small amounts of non-hazardous wastes would be generated from maintenance of the new electrical generator.

**Hazardous and Petroleum Wastes.** The UTES component of the Proposed Action would result in short-term, minor, direct, adverse effects on hazardous and petroleum wastes during the demolition and construction period. Hazardous and petroleum wastes at the existing UTES would be moved to the proposed UTES. Contractors would be responsible for the disposal of hazardous waste in accordance with Federal and MassDEP regulations and the MAARNG Hazardous Material and Waste Management

Plan. Quantities of off-installation transport of hazardous waste would increase during construction and demolition activities.

Adherence to U.S. Army guidelines on energy efficiency and conservation, plans, and programs established at MAARNG would ensure that pollution prevention goals are met.

***Asbestos-Containing Material.*** According to National Emission Standards for Hazardous Air Pollutants, any ACM that is friable or will be made friable during renovation or demolition activities in any public access or commercial building must be inspected and properly abated prior to renovation or demolition if the amount exceeds the trigger levels of 260 linear feet on pipes, 160 square feet on other surfaces, or the volume equivalent of a 55-gallon drum (35 cubic feet). Friable is defined as any material that contains asbestos and when dry can be crumbled, pulverized, or reduced to powder by hand pressure and that contains more than 1 percent asbestos by weight, area, or volume. The term includes nonfriable forms of asbestos after such previously nonfriable material becomes damaged to the extent that when dry it can be crumbled, pulverized, or reduced to powder by hand pressure.

The UTES component of the Proposed Action would result in short-term, minor, direct, adverse effects from the removal and disposal of ACMs during the demolition period. Building 4601 contains ACMs; therefore, all friable asbestos (including asbestos that would be made friable during demolition) would be separated from the remainder of the demolition materials as required and remediated in accordance with Federal (i.e., 40 CFR Part 61.145), commonwealth, and U.S. Army regulations. All ACMs would be handled in accordance with MAARNG's Hazardous Material and Waste Management Plan and all Federal, state, and local rules and regulations and would be disposed of at a permitted landfill. Should debris containing ACMs be discovered during site preparation and excavation, work would immediately stop and measures would be taken to secure the area and prevent the release of ACMs.

***Lead-Based Paint.*** The UTES component of the Proposed Action would result in short-term, minor, direct, adverse effects from the removal and disposal of LBP during the demolition period. Some surfaces of Building 4601 were determined to contain LBP. In accordance with all Federal, state, and local rules and regulations, any identified LBP would be separated from the remainder of the demolition materials as required and remediated in accordance with all Federal, state, and U.S. Army regulations. LBP would be handled in accordance with Federal regulations and the MAARNG's Hazardous Material and Waste Management Plan and would be disposed of at a hazardous waste disposal facility.

***Polychlorinated Biphenyls.*** The UTES component of the Proposed Action would result in short-term, minor, direct, adverse effects from the removal and disposal of any PCBs during the demolition period. Building 4601 contains numerous fluorescent light bulbs, ballasts, and hydraulic door stops that might contain PCBs. These items would be removed prior to demolition and would be handled in accordance with Federal and state regulations and the installation's Hazardous Material and Waste Management Plan. Any transformers outside Building 4601 or the proposed new UTES location would be tested for PCBs prior to altering the utility and treated in accordance with Federal, U.S. Army, local, and state regulations. Any PCBs would be disposed of at a hazardous waste disposal facility.

***Reclaimed Asphalt Pavement.*** The UTES component of the Proposed Action would result in short-term, direct, beneficial effects from the use of RAP during construction. The use of RAP would result in a cost savings in the preparation of sub-base layers and binder aggregate for flexible pavement construction, and the use of RAP would reduce the reliance on virgin raw materials needed during the preparation of both the flexible pavement and permeable parking areas. No adverse effects are anticipated from the use of RAP as compared to conventional paving techniques.

**Installation Restoration Program.** No IRP or IAGWSP sites would be disturbed due to implementation of the UTES component of the Proposed Action.

**Pesticides.** No effects on pesticides would be expected from implementation of the UTES component of the Proposed Action.

#### 4.10.3 Effects of the RTI Component

**Hazardous Materials and Petroleum Products.** Implementation of the RTI component of the Proposed Action would result in short-term effects on hazardous materials and petroleum products that would be similar to those discussed for the UTES component. The RTI component of the Proposed Action would not result in long-term effects on hazardous materials and petroleum products.

**Hazardous and Petroleum Wastes.** Implementation of the RTI component of the Proposed Action would result in effects on hazardous and petroleum wastes that would be similar to those discussed for the UTES component.

**Asbestos-Containing Material.** The RTI component of the Proposed Action would result in short-term, negligible, direct, adverse effects on ACM during the demolition period. The proposed RTI project area is vacant and unimproved and not suspected to contain ACM in the soil. Any ACM affected as a result of asbestos-cement water supply lines would be handled in accordance with MAARNG's Hazardous Material and Waste Management Plan and all Federal, state, and local rules and regulations.

**Lead-Based Paint.** The proposed RTI project area is vacant and unimproved and not suspected to contain LBP in the soil. Therefore, no effects on LBP would be expected within the proposed RTI project area.

**Polychlorinated Biphenyls.** No effects on PCBs would be expected from implementation of the RTI component of the Proposed Action.

**Reclaimed Asphalt Pavement.** The RTI component of the Proposed Action would result in short-term, direct, beneficial effects from the use of RAP during construction. The use of RAP would result in a cost savings in the preparation of sub-base layers and binder aggregate for pavement construction, and the use of RAP would reduce the reliance on virgin raw materials needed during the preparation of parking areas. No adverse effects are anticipated from the use of RAP as compared to conventional paving techniques.

**Installation Restoration Program.** No IRP or IAGWSP sites would be disturbed due to implementation of the RTI component of the Proposed Action.

**Pesticides.** No effects on pesticides would be expected from implementation of the RTI component of the Proposed Action.

#### 4.10.4 Effects of the No Action Alternative

Under the No Action Alternative, the MAARNG would not implement either component of the Proposed Action. Existing hazardous materials and waste resource conditions would continue as described in **Section 3.10.2**. No effects would be expected.

### 4.11 Mitigation Measures and Best Management Practices

Because there are no significant adverse effects, mitigation measures would not be required for the Proposed Action. Standard BMPs for construction- and demolition-related activities would be

implemented to minimize the non-significant, adverse effects from the Proposed Action. A summary of these BMPs is included as follows:

- Use water to minimize fugitive particular matter emissions during construction and demolition.
- Performing maintenance on construction and demolition equipment to potentially lessen their noise levels or replace older equipment with newer, quieter equipment. Use improved mufflers, equipment redesign, intake silencers, ducts, and engine enclosures and noise-attenuating shields or shrouds on all equipment and trucks.
- Use exhaust mufflers on compressed air exhaust and use acoustical shielding on stationary equipment when feasible.
- Install silt fencing and sediment traps, apply water to disturbed soil, and revegetate disturbed areas as soon as possible after the disturbance to control erosion, as appropriate.
- Site new facilities to avoid or minimize effects on wetlands and natural resources.
- In the event of a release of hazardous materials, the installation's Spill Prevention, Control, and Countermeasures Plan would be followed to quickly contain and clean up the release.
- Replant areas disturbed with native vegetation or approved grass seed mixtures following construction and demolition activities.
- Allow wildlife to move out of the path of construction equipment.
- Implement properly designed and maintained erosion and sediment controls and storm water management practices during construction to minimize the potential for any adverse effects on wetlands. Implementation of storm water pollution BMPs during and after construction would minimize the potential for adverse effects associated with runoff from the new facilities.
- In the event that archaeological materials or human remains are inadvertently discovered during construction activities, the MAARNG would follow the procedures outlined in SOP 5 in the installation's ICRMP.

Construction and operations associated with the Proposed Action would comply with all applicable environmental performance standards that were developed as part of the 2001 *Final Area-wide Environmental Impact Report for the Massachusetts National Guard Properties at the Massachusetts Military Reservation*, revised in July 2007. The environmental performance standards include resource specific standards and general activity standards.

## 4.12 Cumulative Effects

CEQ regulations stipulate that the cumulative effects analysis in an EA should consider the potential environmental effects resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions” (40 CFR Part 1508.7). CEQ guidance in considering cumulative effects affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with a proposed action. The scope must consider other projects that coincide with the location and timetable of a proposed action and other actions. Cumulative effects analyses must also evaluate the nature of interactions among these actions (CEQ 1997).



#### 4.12.1 Projects Identified with the Potential for Cumulative Effects

The scope of the cumulative effects analysis involves both timeframe and geographic extent in which effects could be expected to occur, and a description of what resource areas could be cumulatively affected. For the purposes of this analysis, the temporal span of the Proposed Action is from 2013–2015, which includes construction and demolition activities and the beginning of operations. For most resource areas, the spatial areas for consideration of cumulative effects are the MMR and immediately surrounding areas, though a larger area is considered for some resource areas. Camp Edwards was selected as the primary focus for potential cumulative effects because the environmental effects anticipated as a result of the construction and operation of the proposed UTES and RTI facilities would be minor and have limited potential for far-reaching cumulative effects.

An effort was undertaken to identify projects at Camp Edwards and in the surrounding areas, including USCG Air Station Cape Cod and Otis ANG Base, for evaluation in the context of the cumulative effects analysis. For the purposes of this cumulative effects analysis, construction of the UTES and RTI facilities are analyzed and discussed together because they are occurring within the same timeframe, and therefore, could have cumulative effects. All other projects considered for potential cumulative effects are summarized in the following text.

***Northeast Regional Training Center.*** The Northeast Regional Training Center for Homeland Security calls for the construction of nine separate projects, the majority of which will occur in the 3400 and 3500 Areas and include Joint Operations Urban Training Center, Shoot House/Indoor Firing Range, Fire Training facility, Hazardous Materials Training facility, Emergency Driving Course, Administration Center/Emergency Operations Center, Joint Combined Operations in Urban Areas facility, Intermodal Facility, and associated support facilities. A Feasibility Study has been prepared for the construction of the Northeast Regional Training Center, and it is still in planning stages (MAARNG 2005a).

***Roads and Access-Control Points.*** The roads and access-control points project includes the installation of 8,000 feet of new roads; the removal of 26,400 feet of roads; and the realignment or improvement of the Sandwich, Main, and Falmouth gates (MAARNG 2005a). Various phases of this project have been ongoing and would continue in the near future.

***New Railhead Construction.*** The current railhead would be demolished and replaced with a more functional facility adjacent to the golf course on the southern edge of the MMR. Construction related to this project would include retention of 900 feet of the existing rail line to provide a rail car standing area, improvement of an existing access roadway, construction of 3,000 feet of rail line (to house 33 to 43 transport and flatbed rail cars), a 2-acre marshalling yard, a scale house, vehicle-loading ramps, equipment-loading crane, and various support facilities (MAARNG 2005a).

***Modifications to Building 102.*** Building 102 is currently being renovated for use as an interactive historic center at Camp Edwards (MAARNG 2009b).

***Otis ANG Base.*** As a result of the 2005 Base Realignment and Closure actions, the flying mission at Otis ANG Base was converted to an intelligence mission. Consequently, 16 construction projects (net increase of approximately 77,000 ft<sup>2</sup> of facility space) and 3 demolition projects involving multiple facilities (totaling approximately 162,000 ft<sup>2</sup> of facility space) are planned. Additionally, 32 facilities and associated infrastructure will be made available for other Federal uses (NGB 2009). Construction projects have been ongoing and would continue in the near future.

***Off-Installation Projects.*** A review of development proposals in adjacent communities did not reveal any major single project proposal, but rather the continued residential development that has been

ongoing for many years. One activity of note is the rezoning of several parcels to allow for affordable housing (Chapter 40B Residential Housing) and, whereas no proposals have currently been initiated, high-density development will occur in time, bringing greater pressure on resources and area infrastructure (DOD OEA 2005).

#### 4.12.2 Cumulative Effects of Reasonably Foreseeable Actions

A cumulative effects analysis must be conducted within the context of the resource areas. The magnitude and context of the effect on a resource area depends on whether the cumulative effects exceed the capacity of a resource to sustain itself and remain productive (CEQ 1997). The following discusses potential cumulative effects that could occur as a result of implementing the Proposed Action and other past, present, and reasonably foreseeable future actions. No significant adverse, cumulative effects were identified.

**Land Use.** Military training and development activities have occurred with varying intensity at Camp Edwards since before World War II. It is anticipated that development activities would be sited according to the most recent MMR planning document, the Site Consolidation Plan (MAARNG 2005a), which is based on the CWG Master Plan (CCC 1998). As discussed in **Sections 4.1.2** and **4.1.3**, the proposed UTES and RTI facilities would not result in adverse effects on land use plans or policies. Cumulatively, planned projects would result in better land use function and organization and would be compatible with existing and future land uses. Implementation of the Proposed Action and other projects at the MMR would be expected to have no long-term, adverse, cumulative effects on land use.

**Air Quality.** Historically, air quality in the MPI AQCR has been adversely affected by anthropogenic sources; Camp Edwards is within a moderate O<sub>3</sub> nonattainment area. Construction and demolition activities occurring at the same time and in the same vicinity could have short-term, minor, adverse, cumulative effects on air quality. Construction- and demolition-related emissions would last only during those activities and would not be cumulatively significant. As discussed in **Sections 4.2.2** and **4.2.3**, the proposed UTES and RTI projects would have long-term, negligible, adverse effects on air quality. Implementation of the Proposed Action and other projects at the MMR would be expected to have long-term, negligible, adverse cumulative effects.

**Noise.** Military training and development activities have occurred with varying intensity at Camp Edwards since before World War II. Small arms training, helicopter and aircraft activities at Otis ANG Base, and automobile traffic are the dominant noise sources. Construction and demolition activities occurring at the same time and in the same vicinity could have short-term, minor, adverse cumulative effects on the noise environment. As discussed in **Section 4.3.2**, the proposed UTES project would have long-term, negligible, beneficial effects on the noise environment by providing an indoor location to perform vehicle maintenance. As discussed in **Section 4.3.3**, the proposed RTI project would have no long-term effects on the noise environment. Implementation of the Proposed Action and other projects at the MMR would be expected to have no long-term, adverse cumulative effects.

**Earth Resources (Geology, Topography, and Soils).** Soils at Camp Edwards have undergone modifications as a result of development and military activities, particularly in the Cantonment Area. Construction and demolition activities occurring at the same time and in the same vicinity could have short-term, negligible, adverse cumulative effects on earth resources. Direct effects on topography, geology, and soils from construction would be localized to the site that is being developed. Erosion and sediment control during construction activities would ensure that indirect cumulative effects on soils are negligible. As discussed in **Sections 4.4.2** and **4.4.3**, the proposed UTES and RTI projects would have long-term, negligible, adverse effects on earth resources. Implementation of the Proposed Action and other projects at the MMR would be expected to have long-term, negligible, adverse, cumulative effects.

**Water Resources.** The Sagamore Lens is a vital groundwater resource at Camp Edwards as it is a sole-source aquifer. Surface water resources are scarce. Construction and demolition activities occurring at the same time and in the same vicinity could have short-term, negligible, adverse cumulative effects on water resources. Erosion and sediment control and storm water management during construction activities would ensure that indirect cumulative effects on water resources are negligible. As discussed in **Sections 4.5.2 and 4.5.3**, the proposed UTES and RTI projects could result in long-term, negligible, adverse effects. Cumulative development activities could result in an overall increase in facility and parking footprints, which could reduce groundwater infiltration to the Sagamore Lens. Demolition of old, underused facilities, such as those proposed to be demolished on Otis ANG Base, would partially offset those increases. Implementation of the Proposed Action and other projects at the MMR would be expected to have negligible, adverse cumulative effects.

**Biological Resources.** Natural vegetative communities and associated wildlife habitat have been modified by past development and military operations. Considered cumulatively, construction and demolition activities have the potential for short-term, minor, adverse effects and long-term, minor, adverse effects on vegetation and wildlife. However, most installation development activities would occur in previously disturbed areas of Camp Edwards (i.e., the Cantonment Area), which have a lower potential for adverse effects. As discussed in **Section 4.6.2**, the proposed UTES facilities could have short-term, minor, adverse effects on vegetation, wildlife, and wetlands. No effects on protected species would be expected. As discussed in **Section 4.6.3**, the proposed RTI facilities could have short-term, negligible to minor, adverse effects on vegetation and wildlife. No effects on protected species or wetlands would be expected. Implementation of the Proposed Action and other projects at the MMR could have long-term, negligible to minor, adverse, cumulative effects on biological resources as a result of vegetation removal, habitat loss, colonization of nonnative plant species, increased vehicle noise, and degraded wetland quality.

**Cultural Resources.** NRHP-eligible resources are present at Camp Edwards. Building 102 is NRHP-eligible, so alterations to that facility could affect its historic features; however, creation of an interactive historic center could have long-term, beneficial effects by increasing awareness of historic and cultural resources. As discussed in **Sections 4.7.2 and 4.7.3**, the proposed UTES and RTI construction and demolition activities would not be expected to result in short- or long-term effects on archaeological resources; architectural resources; or resources of traditional, religious, or cultural interest to Native American tribes. Therefore, the Proposed Action would have no contribution to cumulative effects on cultural resources.

**Socioeconomic Resources and Environmental Justice.** Construction projects would be expected to result in minor, beneficial effects as a result of job creation and materials procurement. Cumulatively, each project contributes to short-term, beneficial effects. Construction-related expenditures would not generate any long-lasting cumulative benefits.

**Infrastructure.** Camp Edwards has well-developed infrastructure systems that are maintained and improved as needed. Construction and demolition activities occurring at the same time and in the same vicinity could have short-term, negligible to minor, adverse, cumulative effects on infrastructure. For natural gas, liquid fuel, water supply, sanitary sewer and wastewater, and communications systems, any cumulative construction-related increases in demand would be negligible and easily met. Short-term construction-related effects on transportation could be more noticeable, and, therefore, more adverse, if several projects are close together, or if construction, road activities, or utility installations require lane or road closures. These kinds of cumulative effects would be irritating to those using the roadways on Camp Edwards, but they would be short-term and minor inconveniences.

Long-term, negligible, cumulative effects on infrastructure systems are expected. It is likely that new construction, such as the proposed UTES and RTI facilities, would be LEED Silver certified.

Additionally, many new buildings frequently require facility demolition, which offsets increases in facility square footages. As older, outdated facilities are replaced with newer, LEED Silver certified facilities, energy and water efficiencies and better storm water management could result in long-term, beneficial effects, even if the net square footage increases. As discussed in **Section 3.9.2**, a new electrical substation will be needed to meet electrical demands in the near future.

**Hazardous Materials and Waste.** Hazardous wastes and materials and areas of contamination occur at Camp Edwards as a result of its historic use as a military installation. The MAARNG has a Hazardous Material and Waste Management Plan and ICP that guide the use, handling, storage, and disposal of regulated materials in accordance with U.S. Army, Federal, state, and local laws and regulations. Demolition or renovation activities in older buildings, such as Buildings 102 and 4601, have the potential to disturb ACM, LBP, or PCBs. Construction and demolition activities occurring at the same time could have short-term, minor, adverse cumulative effects as a result of increased transportation, storage, use, and disposal of hazardous materials and petroleum products. Current practices and management plans would accommodate these short-term, minor increases. As discussed in **Section 4.10.2**, the proposed UTES facilities would have long-term, negligible, adverse effects because small quantities of fuel would be stored for the new generator; no other long-term effects as a result of the UTES projects were identified. No long-term effects on hazardous materials and wastes would be expected as a result of the proposed RTI facilities. Implementation of the Proposed Action and other projects at the MMR would be expected to have long-term, negligible, adverse, cumulative effects.

#### 4.12.3 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources will have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable timeframe (e.g., energy and minerals). The irreversible environmental changes that would result from implementation of the Proposed Action involve the consumption of material resources, energy resources, and human labor resources. The use of these resources is considered to be permanent.

**Material Resources.** Material resources used for the Proposed Action would be irretrievably lost. These include building materials (for construction of facilities), concrete and asphalt (for parking lots and roads), and various material supplies (for infrastructure). Most of the materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

**Energy Resources.** Energy resources consumed for the Proposed Action would be irretrievably lost. These include petroleum-based products (e.g., gasoline and diesel), natural gas, and electricity. During construction and demolition, gasoline and diesel would be used for the operation of construction vehicles. Natural gas and electricity would be used by operational activities, though this would be a minor increase over the baseline. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant effects would be expected.

**Human Labor Resources.** The use of human resources for construction and operation is considered an irretrievable loss only in that it would preclude these personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities and is considered beneficial.

## 5. Comparison of Alternatives and Conclusions

### 5.1 Comparison of the Environmental Consequences of the Alternatives

**Table 5-1** provides a comparison of the consequences of the Proposed Action and alternatives for each resource area. No significant effects on any resource area would be expected under the Proposed Action or the No Action Alternative.

### 5.2 Conclusions

The Proposed Action would provide a new maintenance and storage facility for tactical and engineering vehicles and training equipment of the MAARNG assigned to Camp Edwards and provide additional classroom training, barracks, and administrative space that fully support the mission of the RTI of the MAARNG. Analysis of the potential effects of the Proposed Action shows that the Proposed Action would not have significant effects on the quality of the human environment nor on the natural environment.

Furthermore, implementation of the No Action Alternative would not provide the MAARNG with a modern and appropriately sized UTES that provides a functional workspace for efficient vehicle and equipment maintenance, and it would not provide the RTI of the MAARNG with additional modern classroom, administrative, and lodging space to improve training effectiveness and capabilities. Therefore, the MAARNG proposes to implement the Proposed Action. Based on the analysis contained in this EA, an EIS would not be required and the MAARNG would issue a FNSI.

**Table 5-1. Comparison of Alternatives**

Resource Area	Proposed Action		No Action Alternative
	UTES Component	RTI Component	
Land Use	No adverse effects on land use plans or policies associated with long-term planning would occur. Short- and long-term, minor, adverse effects on land use policies and plans associated with groundwater protection would occur.	No adverse effects on land use plans or policies associated with long-term planning would occur. Short- and long-term, minor, adverse effects on land use policies and plans associated with groundwater protection would occur.	There would be no change in land use conditions and no adverse effects would occur.
Air Quality	Short-term, minor, adverse and long-term, negligible, adverse effects on air quality would occur. Construction and demolition activities would generate air emissions over the short-term. Operation of furnaces and an emergency generator would generate air emissions over the long-term.	Short-term, minor, adverse and long-term, negligible, adverse effects on air quality would occur. Construction activities would generate air emissions over the short-term. Operation of furnaces would generate air emissions over the long-term.	There would be no change in air quality and no adverse effects would occur.
	For all years, air emissions from the Proposed Action are well below the General Conformity Rule <i>de minimis</i> threshold limits, and there would be no impacts on the installation’s air permit requirements.		
Noise	Short-term, minor, adverse effects on the noise environment would be expected from the use of heavy equipment and the introduction of additional vehicle traffic during construction and demolition activities. Long-term, negligible, beneficial effects on the noise environment would be expected because the proposed UTES would allow the MAARNG to conduct maintenance on oversized vehicles indoors.	Short-term, minor, adverse effects on the noise environment would be expected from the use of heavy equipment and the introduction of additional vehicle traffic during construction activities. No long-term effects would occur.	There would be no change in noise conditions and no adverse effects would occur.

Resource Area	Proposed Action		No Action Alternative
	UTES Component	RTI Component	
<b>Earth Resources</b>	Short- and long-term, negligible, adverse effects on earth resources would occur from soil compaction, erosion, and sedimentation. Construction would not substantially alter the geology and topography of the site, and the soils present on site are previously disturbed. Site-specific soil testing would determine if soil limitations exist. Short- and long-term storm water control measures that favor reinfiltration would minimize the potential for erosion and sediment production.	Short- and long-term, negligible, adverse effects on earth resources would occur from soil compaction, erosion, sedimentation, and an increase in impervious surfaces. Construction would not substantially alter the geology and topography of the site, and the soils present on site are previously disturbed. Site-specific soil testing would determine if soil limitations exist. Short- and long-term storm water control measures that favor reinfiltration would minimize the potential for erosion and sediment production.	There would be no change in earth resources and no adverse effects would occur.
<b>Water Resources</b>	Short-term, negligible, adverse effects would occur from the excavation of soils, erosion of disturbed soils, and potential transport of sediment and contaminants during storm water flow events. Ensuring onsite storm water infiltration during construction activities, as required by Section 438 of the EISA, would sustain and recharge groundwater and minimize storm water runoff. No long-term effects on water resources would be expected.	Short-term, negligible, adverse effects would occur from the excavation of soils, erosion of disturbed soils, and potential transport of sediment and contaminants during storm water flow events. Ensuring onsite storm water infiltration during construction activities, as required by Section 438 of the EISA, would sustain and recharge groundwater and minimize storm water runoff. Long-term, minor, adverse effects would occur from an increase in impervious surface.	There would be no change in water resources and no adverse effects would occur.

Resource Area	Proposed Action		No Action Alternative
	UTES Component	RTI Component	
<b>Biological Resources</b>	Short-term, minor, adverse effects on vegetation would occur as a result of habitat loss and invasive species introduction associated with construction and demolition activities. Wildlife would be permanently displaced from the areas where habitat is cleared for construction and temporarily displaced from areas adjacent to the project areas during construction and demolition periods. No effects are expected to occur on listed species. Short-term, minor, indirect, adverse effects on nearby wetlands and waters of the United States would occur as a result of construction and demolition activities.	Short-term, minor, adverse effects on vegetation would occur as a result of habitat loss and invasive species introduction associated with construction activities. Long-term, minor, adverse effects would occur from the permanent removal of grass within the footprint of development and an increase in impervious surfaces. Wildlife would be permanently displaced from the areas where habitat is cleared for construction and temporarily displaced from areas adjacent to the project areas during construction periods. No effects are expected to occur on listed species. No effects on wetlands and waters of the United States would occur.	There would be no change in biological resources and no adverse effects would occur.
<b>Cultural Resources</b>	No effects on cultural resources under NEPA would occur. The cantonment area of Camp Edwards, which includes the APE, has been determined to have no potential for the preservation of intact archaeological deposits. The existing UTES building and associated complex have been determined not eligible for listing in the NRHP by the Massachusetts Historical Commission due to insufficient physical integrity. The MAARNG has consulted with the Mashpee Wampanoag Tribe, and this consultation has determined that there are no resources of traditional, religious, or cultural interest to the tribe at or near the proposed UTES.	No effects on cultural resources under NEPA would occur. The cantonment area of Camp Edwards, which includes the APE, has been determined to have no potential for the preservation of intact archaeological deposits. No NRHP eligible or unevaluated buildings are within the viewshed of the proposed RTI facilities. No resources of traditional, religious, or cultural interest have been identified at or near the proposed RTI buildings.	There would be no change in cultural resources and no adverse effects would occur.



Resource Area	Proposed Action		No Action Alternative
	UTES Component	RTI Component	
<b>Socioeconomics and Environmental Justice</b>	Short-term, minor, beneficial effects on the local economy would occur during construction and demolition from the added economic spending in the region. No long-term effects would be expected. There would be no environmental justice effects.	Short-term, minor, beneficial effects on the local economy would occur during construction from the added economic spending in the region. There would be no environmental justice effects.	There would be no change in socioeconomic and environmental justice conditions and no adverse effects would occur.
<b>Infrastructure</b>	Short-term, minor, adverse effects on the transportation network would occur due to increased traffic and parking lot use associated with construction and demolition equipment and contractor vehicles. Short-term interruptions of utilities could be experienced when buildings are disconnected from or connected to the existing utility services. Long-term, minor, adverse effects on utilities would be expected due to the increase in building space.	Short-term, minor, adverse effects on the transportation network would occur due to increased traffic and parking lot use associated with construction equipment and contractor vehicles. There would be a reduction of 30 car and 7 bus parking spaces at the existing RTI parking lot. The loss of these parking spaces would leave 142 car spaces and no bus parking spaces at the RTI campus. Short-term interruptions of utilities could be experienced when the proposed buildings are connected to the existing utility services. Long-term, minor, adverse effects on utilities would be expected due to the increase in building space.	There would be no change in infrastructure conditions and no adverse effects would occur.
<b>Hazardous Materials and Wastes</b>	Short-term, minor, adverse effects on hazardous materials and wastes would occur during construction and demolition activities. Construction and demolition activities have the potential to disturb ACMs, LBP, and PCBs. No IRP or IAGWSP sites would be disturbed.	Short-term, minor, adverse effects on hazardous materials and wastes would occur during construction activities. Construction activities have the potential to disturb ACMs in buried utility lines. No IRP or IAGWSP sites would be disturbed.	There would be no change in hazardous materials and wastes and no adverse effects would occur.

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## 7. Acronyms and Abbreviations

µg/m <sup>3</sup>	micrograms per cubic meter	ENF	Environmental Notification Form
ACM	asbestos-containing material	EO	Executive Order
ANG	Air National Guard	ESA	Endangered Species Act
APE	Area of Potential Effect	FAA	Federal Aviation Administration
AQCR	Air Quality Control Region	FEMA	Federal Emergency Management Agency
AR	Army Regulation	FNSI	Finding of No Significant Impact
AT/FP	anti-terrorism/force-protection	FPPA	Farmland Protection Policy Act
BMP	Best Management Practice	FS-24	Fuel Spill 24
BOMARC	Boeing Michigan Aeronautical Research Center	ft <sup>2</sup>	square feet
CAA	Clean Air Act	FY	fiscal year
CDP	Census Designated Place	GHG	Greenhouse Gas
CEQ	Council on Environmental Quality	HAP	hazardous air pollutant
CFR	Code of Federal Regulations	HUD	Housing and Urban Development
CGP	Construction General Permit	IAGWSP	Impact Area Groundwater Study Program
CMR	Commonwealth of Massachusetts Regulation	ICP	Integrated Contingency Plan
CO	carbon monoxide	ICRMP	Integrated Cultural Resources Management Plan
CO <sub>2</sub>	carbon dioxide	IRP	Installation Restoration Program
CS-10	Chemical Spill 10	LBP	lead-based paint
CWA	Clean Water Act	LEED	Leadership in Energy and Environmental Design
CWG	Community Working Group	LID	low-impact development
dBA	A-weighted decibel	MAARNG	Massachusetts Army National Guard
DNL	Day-Night Average Sound Level	MADFW	Massachusetts Division of Fisheries and Wildlife
DOD	Department of Defense	MassDEP	Massachusetts Department of Environmental Protection
EA	Environmental Assessment	MBTA	Migratory Bird Treaty Act
EIR	Environmental Impact Report	MEPA	Massachusetts Environmental Policy Act
EIS	Environmental Impact Statement		
EISA	Energy Independence and Security Act		
ELG	Effluent Limitations Guidelines		

MESA	Massachusetts Endangered Species Act	ppb	parts per billion
mg/m <sup>3</sup>	milligrams per cubic meter	ppm	parts per million
MLD	Military Land Use District	PSD	Prevention of Significant Deterioration
MMR	Massachusetts Military Reservation	RAP	Reclaimed Asphalt Pavement
MPI	Metropolitan Providence Interstate	RCRA	Resource Conservation and Recovery Act
MSL	mean sea level	ROI	Region of Influence
NAAQS	National Ambient Air Quality Standards	RTI	Regional Training Institute
NANSR	Nonattainment Major New Source Review	SAAQS	State Ambient Air Quality Standards
NEPA	National Environmental Policy Act	SDWA	Safe Drinking Water Act
NHESP	Natural Heritage & Endangered Species Program	SIP	State Implementation Plan
NHPA	National Historic Preservation Act	SO <sub>2</sub>	sulfur dioxide
NO <sub>2</sub>	nitrogen dioxide	SOP	Standard Operating Procedure
NO <sub>x</sub>	nitrogen oxides	SRP	Special Review Procedure
NPL	National Priorities List	SSPP	Strategic Sustainability Performance Plan
NRHP	National Register of Historic Places	SWPPP	Storm Water Pollution Prevention Plan
NSR	New Source Review	TMDL	Total Maximum Daily Load
O <sub>3</sub>	ozone	tpy	tons per year
OSHA	Occupational Safety and Health Administration	TSCA	Toxic Substance Control Act
Pb	lead	TTB	Tactical Training Base
PCB	polychlorinated biphenyl	U.S.C.	United States Code
pCi/L	picocuries per liter	USACE	U.S. Army Corps of Engineers
percent g	percent gravity	USCG	U.S. Coast Guard
PM <sub>10</sub>	particulate matter less than 10 microns in diameter	USEPA	U.S. Environmental Protection Agency
PM <sub>2.5</sub>	particulate matter equal to or less than 2.5 microns in diameter	USFWS	U.S. Fish and Wildlife Service
POL	petroleum, oils, and lubricants	USGS	U.S. Geological Survey
POV	Privately Owned Vehicle	UST	underground storage tank
		UTES	Unit Training Equipment Site
		VOC	volatile organic compound

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This EA was prepared under the direction of the MAARNG by HDR Inc. Individuals from HDR who contributed to the preparation of this document are listed below.

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## **9. Agencies and Individuals Contacted**

Each of the agencies and individuals listed below has received a copy of the Draft EA for the opportunity to review and comment. Comments were received on the Draft EA from the Massachusetts Historical Commission, the Stockbridge-Munsee Tribal Historic Preservation Office, the U.S. Department of Agriculture Natural Resources Conservation Service, and the Environmental Management Commission during the review period. A copy of the letter sent to each agency and individual listed below and a copy of the responses received have been included in **Appendix C**.

### **FEDERAL AGENCIES**

#### **United States Army Corps of Engineers**

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#### **United States Department of Agriculture**

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#### **United States Environmental Protection Agency**

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#### **United States Fish & Wildlife Service**

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Hadley, MA 01035-9589  
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### **STATE AGENCIES**

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#### **Massachusetts Department of Environmental Protection**

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**Massachusetts Department of Conservation and Recreation**

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**Massachusetts Department of Conservation and Recreation**

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**Town of Sandwich**

130 Main Street  
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**Town of Falmouth**

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**Stockbridge - Munsee Tribe of Mohican, Wisconsin**

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## **APPENDIX A**

### **SELECT PHOTOGRAPHS OF THE PROPOSED ACTION AND ALTERNATIVES**



## **Appendix A**

### **Select Photographs of the Proposed Action and Alternatives**

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**Photograph 1. The Preferred Location for the UTES Looking North.**



**Photograph 2. The Exterior of the Existing UTES (Building 4601) Looking South.**



**Photograph 3. The Interior of the Existing UTES (Building 4601) Looking South.**



**Photograph 4. The Location for the Proposed RTI Barracks Building Looking East.  
Building 5236 is in the Background.**



**Photograph 5. The Location for the Proposed RTI Education Building  
Looking West toward Turpentine Road.**



**Photograph 6. Example Classroom at the Existing RTI Building (Building 5222).**





**Photograph 7. The 2800 Area of Camp Edwards.**



**Photograph 8. The 3600 Area of Camp Edwards.  
A Tactical Training Base was Constructed at this Area.**

## **APPENDIX B**

### **APPLICABLE LAWS, REGULATIONS, POLICIES, AND PLANNING CRITERIA**





## Appendix B

### Applicable Laws, Regulations, Policies, and Planning Criteria

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When considering the affected environment, the various physical, biological, economic, and social environmental factors must be considered. In addition to the National Environmental Policy Act (NEPA), there are other environmental laws and Executive Orders (EOs) to be considered when preparing environmental analyses. These laws are summarized below.

*NOTE: This is not a complete list of all applicable laws, regulations, policies, and planning criteria potentially applicable to documents, however, it does provide a general summary for use as a reference.*

#### Airspace Management

Airspace management procedures assist in preventing potential conflicts or accidents associated with aircraft using designated airspace in the United States, including restricted military airspace. Airspace management involves the coordination, integration, and regulation of the use of airspace. The Federal Aviation Administration (FAA) has overall responsibility for managing airspace through a system of flight rules and regulations, airspace management actions, and air traffic control (ATC) procedures. All military and civilian aircraft are subject to Federal Aviation Regulations (FARs). The FAA's *Aeronautical Information Manual* defines the operational requirements for each of the various types or classes of military and civilian airspace.

Some military services have specific guidance for airspace management. For example, Army Regulation (AR) 95-2, *Airspace, Airfields/Heliport, Flight Activities, Air Traffic Control and Navigational Aids*, provides guidance and procedures for U.S. Army airspace operations.

#### Noise

Federal, state, and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. The Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978, requires compliance with state and local noise laws and ordinances.

The U.S. Department of Housing and Urban Development (HUD), in coordination with the Department of Defense (DOD) and the FAA, has established criteria for acceptable noise levels for aircraft operations relative to various types of land use.

The U.S. Army, through AR 200-1, *Environmental Protection and Enhancement*, implements Federal laws concerning environmental noise from U.S. Army activities.

#### Land Use

The term "land use" refers to real property classifications that indicate either natural conditions or the types of human activities occurring on a defined parcel of land. In many cases, land use descriptions are codified in local zoning laws. However, there is no nationally recognized convention or uniform terminology for describing land use categories.

Land use guidelines established by the HUD and based on findings of the Federal Interagency Committee on Noise (FICON) are used to recommend acceptable levels of noise exposure for land use. The U.S. Army uses the 12 land use types for installation land use planning, and these land use types roughly parallel those employed by municipalities in the civilian sector.

## **Air Quality**

The Clean Air Act (CAA) of 1970, and Amendments of 1977 and 1990, recognizes that increases in air pollution result in danger to public health and welfare. To protect and enhance the quality of the Nation's air resources, the CAA authorizes the U.S. Environmental Protection Agency (USEPA) to set six National Ambient Air Quality Standards (NAAQS) which regulate carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter pollution emissions. The CAA seeks to reduce or eliminate the creation of pollutants at their source, and designates this responsibility to state and local governments. States are directed to utilize financial and technical assistance and leadership from the Federal government to develop implementation plans to achieve NAAQS. Geographic areas are officially designated by the USEPA as being in attainment or nonattainment for pollutants in relation to their compliance with NAAQS. Geographic regions established for air quality planning purposes are designated as Air Quality Control Regions (AQCRs). Pollutant concentration levels are measured at designated monitoring stations within the AQCR. An area with insufficient monitoring data is designated as unclassified. Section 309 of the CAA authorizes USEPA to review and comment on impact statements prepared by other agencies.

An agency should consider what effect an action might have on NAAQS due to short-term increases in air pollution during construction and long-term increases resulting from changes in traffic patterns. For actions in attainment areas, a Federal agency could also be subject to USEPA's Prevention of Significant Deterioration (PSD) regulations. These regulations apply to new major stationary sources and modifications to such sources. Although few agency facilities will actually emit pollutants, increases in pollution can result from a change in traffic patterns or volume. Section 118 of the CAA waives Federal immunity from complying with the CAA and states all Federal agencies will comply with all Federal- and state-approved requirements.

The General Conformity Rule requires that any Federal action meet the requirements of a State Implementation Plan (SIP) or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

The General Conformity Rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to Federal actions that are considered "regionally significant" or where the total emissions from the action meet or exceed the *de minimis* thresholds presented in 40 Code of Federal Regulations (CFR) 93.153. An action is regionally significant when the total nonattainment pollutant emissions exceed 10 percent of the AQCR's total emissions inventory for that nonattainment pollutant. If a Federal action does not meet or exceed the *de minimis* thresholds and is not considered regionally significant, then a full Conformity Determination is not required.

On May 13, 2010, the USEPA issued the Greenhouse Gas (GHG) Tailoring Rule that sets thresholds for GHG emissions from large stationary sources. The new GHG emissions thresholds for large stationary sources define when permits under the New Source Review Prevention of PSD and Title V Operating Permit programs are required for new and existing industrial facilities. Beginning January 2, 2011, large industrial facilities that have CAA permits for non-GHG emissions must also include GHGs in these

permits. Beginning July 1, 2011, all new construction or renovations that increase GHG emissions by 75,000 tons of carbon dioxide or equivalent per year or more will be required to obtain construction permits for GHG emissions. Operating permits will be needed by all sources that emit GHGs above 75,000 tons of carbon dioxide or equivalent per year beginning in July 2011.

## **Health and Safety**

Human health and safety relates to workers' health and safety during demolition or construction of facilities, or applies to work conditions during operations of a facility that could expose workers to conditions that pose a health or safety risk. The Federal Occupational Safety and Health Administration (OSHA) issues standards to protect persons from such risks, and the DOD and state and local jurisdictions issue guidance to comply with these OSHA standards. Safety also can refer to safe operations of aircraft or other equipment.

U.S. Army regulations in AR 385-10, *Army Safety Program*, prescribe policy, responsibilities, and procedures to protect and preserve U.S. Army personnel and property from accidental loss or injury. AR 40-5, *Preventive Medicine*, provides for the promotion of health and the prevention of disease and injury.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (April 23, 1997), directs Federal agencies to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. Federal agencies must also ensure that their policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks.

## **Geology and Soil Resources**

Recognizing that millions of acres per year of prime farmland are lost to development, Congress passed the Farmland Protection Policy Act (FPPA) to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland (7 CFR Part 658). Prime farmland is described as soils that have a combination of soil and landscape properties that make them highly suitable for cropland, such as high inherent fertility, good water-holding capacity, and deep or thick effective rooting zones, and that are not subject to periodic flooding. Under the FPPA, agencies are encouraged to conserve prime or unique farmlands when alternatives are practicable. Some activities that are not subject to the FPPA include Federal permitting and licensing, projects on land already in urban development or used for water storage, construction for national defense purposes, or construction of new minor secondary structures such as a garage or storage shed.

## **Water Resources**

The Clean Water Act (CWA) of 1977 is an amendment to the Federal Water Pollution Control Act of 1972, is administered by USEPA, and sets the basic structure for regulating discharges of pollutants into U.S. waters. The CWA requires USEPA to establish water quality standards for specified contaminants in surface waters and forbids the discharge of pollutants from a point source into navigable waters without a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits are issued by USEPA or the appropriate state if it has assumed responsibility. Section 404 of the CWA establishes a Federal program to regulate the discharge of dredge and fill material into waters of the United States. Section 404 permits are issued by the U.S. Army Corps of Engineers (USACE). Waters of the United States include interstate and intrastate lakes, rivers, streams, and wetlands that are used for commerce, recreation, industry, sources of fish, and other purposes. The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Each agency should

consider the impact on water quality from actions such as the discharge of dredge or fill material into U.S. waters from construction, or the discharge of pollutants as a result of facility occupation.

Section 303(d) of the CWA requires states and USEPA to identify waters not meeting state water quality standards and to develop Total Maximum Daily Loads (TMDLs). A TMDL is the maximum amount of a pollutant that a waterbody can receive and still be in compliance with state water quality standards. After determining TMDLs for impaired waters, states are required to identify all point and nonpoint sources of pollution in a watershed that are contributing to the impairment and to develop an implementation plan that will allocate reductions to each source to meet the state standards. The TMDL program is currently the Nation's most comprehensive attempt to restore and improve water quality. The TMDL program does not explicitly require the protection of riparian areas. However, implementation of the TMDL plans typically calls for restoration of riparian areas as one of the required management measures for achieving reductions in nonpoint source pollutant loadings.

The USEPA issued a Final Rule for the CWA concerning technology-based Effluent Limitations Guidelines and New Source Performance Standards for the Construction and Development point source category. All NPDES storm water permits issued by the USEPA or states must incorporate requirements established in the Final Rule. As of February 1, 2010, all new construction sites are required to meet the non-numeric effluent limitations and design, install, and maintain effective erosion and sedimentation controls. In addition, construction site owners and operators that disturb 1 or more acres of land are required to use best management practices (BMPs) to ensure that soil disturbed during construction activities does not pollute nearby water bodies. Effective August 1, 2011, construction activities disturbing 20 or more acres must comply with the numeric effluent limitation for turbidity in addition to the non-numeric effluent limitations. The maximum daily turbidity limitation is 280 nephelometric turbidity units (ntu). On February 2, 2014, construction site owners and operators that disturb 10 or more acres of land are required to monitor discharges to ensure compliance with effluent limitations as specified by the permitting authority. Construction site owners are encouraged to phase ground-disturbing activities to limit the applicability of the monitoring requirements and the turbidity limitation. The USEPA's limitations are based on its assessment of what specific technologies can reliably achieve. Permittees can select management practices or technologies that are best suited for site-specific conditions.

The Coastal Zone Management Act (CZMA) of 1972 declares a national policy to preserve, protect, and develop, and, where possible, restore or enhance the resources of the Nation's coastal zone. The coastal zone refers to the coastal waters and the adjacent shorelines, including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches, and includes the Great Lakes. The CZMA encourages states to exercise their full authority over the coastal zone through the development of land and water use programs in cooperation with Federal and local governments. States may apply for grants to help develop and implement management programs to achieve wise use of the land and water resources of the coastal zone. Under Section 307, Federal agency activities that affect any land or water use or natural resource of a coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the state's coastal management program.

The Safe Drinking Water Act (SDWA) of 1974 establishes a Federal program to monitor and increase the safety of all commercially and publicly supplied drinking water. Congress amended the SDWA in 1986, mandating dramatic changes in nationwide safeguards for drinking water and establishing new Federal enforcement responsibility on the part of USEPA. The 1986 amendments to the SDWA require USEPA to establish Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and Best Available Technology (BAT) treatment techniques for organic, inorganic, radioactive, and microbial contaminants; and turbidity. MCLGs are maximum concentrations below which no negative human

health effects are known to exist. The 1996 amendments set current Federal MCLs, MCLGs, and BATs for organic, inorganic, microbiological, and radiological contaminants in public drinking water supplies.

The Wild and Scenic Rivers Act of 1968 provides for a wild and scenic river system by recognizing the remarkable values of specific rivers of the Nation. These selected rivers and their immediate environment are preserved in a free-flowing condition, without dams or other construction. The policy not only protects the water quality of the selected rivers but also provides for the enjoyment of present and future generations. Any river in a free-flowing condition is eligible for inclusion, and can be authorized as such by an Act of Congress, an act of state legislature, or by the Secretary of the Interior upon the recommendation of the governor of the state(s) through which the river flows.

EO 11988, *Floodplain Management* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in floodplains. An agency may locate a facility in a floodplain if the head of the agency finds there is no practicable alternative. If it is found there is no practicable alternative, the agency must minimize potential harm to the floodplain, and circulate a notice explaining why the action is to be located in the floodplain prior to taking action. Finally, new construction in a floodplain must apply accepted floodproofing and flood protection to include elevating structures above the base flood level rather than filling in land.

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (October 5, 2009), directed the USEPA to issue guidance on Section 438 of the Energy Independence and Security Act (EISA). The EISA establishes into law new storm water design requirements for Federal construction projects that disturb a footprint of greater than 5,000 square feet of land. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Predevelopment hydrology would be calculated and site design would incorporate storm water retention and reuse technologies to the maximum extent technically feasible. Post-construction analyses will be conducted to evaluate the effectiveness of the as-built storm water reduction features. These regulations are applicable to DOD Unified Facilities Criteria. Additional guidance is provided in the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*.

EO 13514 also requires Federal agencies to improve water efficiency and management by reducing potable water consumption intensity by 2 percent annually, or by 26 percent, by Fiscal Year (FY) 2020, relative to a FY 2007 baseline. Furthermore, Federal agencies must also reduce agency industrial, landscaping, and agricultural water consumption by 2 percent annually, or 20 percent, by FY 2020, relative to a FY 2010 baseline.

EO 13547, *Stewardship of the Ocean, Our Coasts, and the Great Lakes* (July 19, 2010), establishes a national policy to ensure the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources; enhance the sustainability of ocean and coastal economies; preserve our maritime heritage; support sustainable uses and access; provide for adaptive management to enhance our understanding of and capacity to respond to climate change and ocean acidification; and coordinate with our national security and foreign policy interests.

## **Biological Resources**

The Endangered Species Act (ESA) of 1973 establishes a Federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure any action they authorize, fund, or carry out is not likely to

jeopardize the continued existence of an endangered or threatened species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially endangered or threatened, and the U.S. Fish and Wildlife Service (USFWS) maintains the list. A list of Federal endangered species can be obtained from the Endangered Species Division, USFWS (703-358-2171). States might also have their own lists of threatened and endangered species which can be obtained by calling the appropriate State Fish and Wildlife office. Some species also have laws specifically for their protection (e.g., Bald Eagle Protection Act).

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties and conventions between the United States, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess; offer to or sell, barter, purchase, or deliver; or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. The MBTA also makes it unlawful to ship, transport, or carry from one state, territory, or district to another; or through a foreign country, any bird, part, nest, or egg that was captured, killed, taken, shipped, transported, or carried contrary to the laws from where it was obtained; and import from Canada any bird, part, nest, or egg obtained contrary to the laws of the province from which it was obtained. The U.S. Department of the Interior has authority to arrest, with or without a warrant, a person violating the MBTA.

The Sikes Act (16 U.S.C. 670a-670o, 74 Stat. 1052), as amended, Public Law (P.L.) 86-797, approved September 15, 1960, provides for cooperation by the Departments of the Interior and Defense with state agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the United States. In November 1997, the Sikes Act was amended via the Sikes Act Improvement Amendment (P.L. 105-85, Division B, Title XXIX) to require the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations. To facilitate this program, the amendments require the Secretaries of the military departments to prepare and implement Integrated Natural Resources Management Plans (INRMPs) for each military installation in the United States unless the absence of significant natural resources on a particular installation makes preparation of a plan for the installation inappropriate. INRMPs must be reviewed by the USFWS and applicable states every 5 years. The National Defense Authorization Act of 2004 modified Section 4(a) (3) of the ESA to preclude the designation of critical habitat on DOD lands that are subject to an INRMP, if the Secretary of the Interior determines in writing that such a plan provides a benefit to the species for which critical habitat is proposed for designation.

EO 11514, *Protection and Enhancement of Environmental Quality* (March 5, 1970), states that the President, with assistance from the Council on Environmental Quality (CEQ), will lead a national effort to provide leadership in protecting and enhancing the environment for the purpose of sustaining and enriching human life. Federal agencies are directed to meet national environmental goals through their policies, programs, and plans. Agencies should also continually monitor and evaluate their activities to protect and enhance the quality of the environment. Consistent with NEPA, agencies are directed to share information about existing or potential environmental problems with all interested parties, including the public, in order to obtain their views.

EO 11990, *Protection of Wetlands* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland. Agencies should use economic and environmental data, agency mission statements, and any other

pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands.

EO 13186, *Conservation of Migratory Birds* (January 10, 2001), creates a more comprehensive strategy for the conservation of migratory birds by the Federal government. EO 13186 provides a specific framework for the Federal government's compliance with its treaty obligations to Canada, Mexico, Russia, and Japan. EO 13186 provides broad guidelines on conservation responsibilities and requires the development of more detailed guidance in a Memorandum of Understanding (MOU). EO 13186 will be coordinated and implemented by the USFWS. The MOU will outline how Federal agencies will promote conservation of migratory birds. EO 13186 requires the support of various conservation planning efforts already in progress; incorporation of bird conservation considerations into agency planning, including NEPA analyses; and reporting annually on the level of take of migratory birds.

## **Cultural Resources**

The American Indian Religious Freedom Act of 1978 and Amendments of 1994 recognize that freedom of religion for all people is an inherent right, and traditional American Indian religions are an indispensable and irreplaceable part of Indian life. It also recognized the lack of Federal policy on this issue and made it the policy of the United States to protect and preserve the inherent right of religious freedom for Native Americans. The 1994 Amendments provide clear legal protection for the religious use of peyote cactus as a religious sacrament. Federal agencies are responsible for evaluating their actions and policies to determine if changes should be made to protect and preserve the religious cultural rights and practices of Native Americans. These evaluations must be made in consultation with native traditional religious leaders.

The ARPA of 1979 protects archaeological resources on public and American Indian lands. It provides felony-level penalties for the unauthorized excavation, removal, damage, alteration, or defacement of any archaeological resource, defined as material remains of past human life or activities which are at least 100 years old. Before archaeological resources are excavated or removed from public lands, the Federal land manager must issue a permit detailing the time, scope, location, and specific purpose of the proposed work. ARPA also fosters the exchange of information about archaeological resources between governmental agencies, the professional archaeological community, and private individuals. ARPA is implemented by regulations found in 43 CFR Part 7.

The National Historic Preservation Act (NHPA) of 1966 sets forth national policy to identify and preserve properties of state, local, and national significance. The NHPA establishes the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), and the National Register of Historic Places (NRHP). The ACHP advises the President, Congress, and Federal agencies on historic preservation issues. Section 106 of the NHPA directs Federal agencies to take into account effects of their undertakings (actions and authorizations) on properties included in or eligible for the NRHP. Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties. Section 106 of the act is implemented by regulations of the ACHP, 36 CFR Part 800. Agencies should coordinate studies and documents prepared under Section 106 with NEPA where appropriate. However, NEPA and NHPA are separate statutes and compliance with one does not constitute compliance with the other. For example, actions which qualify for a categorical exclusion under NEPA might still require Section 106 review under NHPA. It is the responsibility of the agency official to identify properties in the area of potential effects, and whether they are included or eligible for inclusion in the NRHP. Section 110 of the NHPA requires Federal agencies to identify, evaluate, and nominate historic property under agency control to the NRHP.

The NAGPRA of 1990 establishes rights of American Indian tribes to claim ownership of certain “cultural items,” defined as Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony, held or controlled by Federal agencies. Cultural items discovered on Federal or tribal lands are, in order of primacy, the property of lineal descendants, if these can be determined, and then the tribe owning the land where the items were discovered or the tribe with the closest cultural affiliation with the items. Discoveries of cultural items on Federal or tribal land must be reported to the appropriate American Indian tribe and the Federal agency with jurisdiction over the land. If the discovery is made as a result of a land use, activity in the area must stop and the items must be protected pending the outcome of consultation with the affiliated tribe.

EO 11593, *Protection and Enhancement of the Cultural Environment* (May 13, 1971), directs the Federal government to provide leadership in the preservation, restoration, and maintenance of the historic and cultural environment. Federal agencies are required to locate and evaluate all Federal sites under their jurisdiction or control which might qualify for listing on the NRHP. Agencies must allow the ACHP to comment on the alteration, demolition, sale, or transfer of property which is likely to meet the criteria for listing as determined by the Secretary of the Interior in consultation with the SHPO. Agencies must also initiate procedures to maintain federally owned sites listed on the NRHP.

EO 13007, *Indian Sacred Sites* (May 24, 1996), provides that agencies managing Federal lands, to the extent practicable, permitted by law, and not inconsistent with agency functions, shall accommodate American Indian religious practitioners’ access to and ceremonial use of American Indian sacred sites, shall avoid adversely affecting the physical integrity of such sites, and shall maintain the confidentiality of such sites. Federal agencies are responsible for informing tribes of proposed actions that could restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites.

EO 13175, *Consultation and Coordination with Indian Tribal Governments* (November 6, 2000), was issued to provide for regular and meaningful consultation and collaboration with Native American tribal officials in the development of Federal policies that have tribal implications, and to strengthen the United States government-to-government relationships with Native American tribes. EO 13175 recognizes the following fundamental principles: Native American tribes exercise inherent sovereignty over their lands and members, the United States government has a unique trust relationship with Native American tribes and deals with them on a government-to-government basis, and Native American tribes have the right to self-government and self-determination.

EO 13287, *Preserve America* (March 3, 2003), orders Federal agencies to take a leadership role in protection, enhancement, and contemporary use of historic properties owned by the Federal government, and promote intergovernmental cooperation and partnerships for preservation and use of historic properties. EO 13287 established new accountability for agencies with respect to inventories and stewardship.

## **Socioeconomics and Environmental Justice**

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), directs Federal agencies to make achieving environmental justice part of their mission. Agencies must identify and address the adverse human health or environmental effects that its activities have on minority and low-income populations, and develop agencywide environmental justice strategies. The strategy must list “programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations, ensure greater public participation, improve research and data collection relating to the health of and environment of minority populations and low-income populations, and identify



differential patterns of consumption of natural resources among minority populations and low-income populations.” A copy of the strategy and progress reports must be provided to the Federal Working Group on Environmental Justice. Responsibility for compliance with EO 12898 is with each Federal agency.

## **Hazardous Materials and Waste**

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 authorizes USEPA to respond to spills and other releases of hazardous substances to the environment, and authorizes the National Oil and Hazardous Substances Pollution Contingency Plan. CERCLA also provides a Federal “Superfund” to respond to emergencies immediately. Although the “Superfund” provides funds for cleanup of sites where potentially responsible parties cannot be identified, USEPA is authorized to recover funds through damages collected from responsible parties. This funding process places the economic burden for cleanup on polluters. Section 120(h) of CERCLA requires Federal agencies to notify prospective buyers of contaminated Federal properties about the type, quantity, and location of hazardous substances that would be present.

The Pollution Prevention Act (PPA) of 1990 encourages manufacturers to avoid the generation of pollution by modifying equipment and processes; redesigning products; substituting raw materials; and making improvements in management techniques, training, and inventory control. Consistent with pollution prevention principles, EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (January 24, 2007 [revoking EO 13148]), sets a goal for all Federal agencies to promote environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products; and use of paper of at least 30 percent post-consumer fiber content. In addition, EO 13423 sets a goal that requires Federal agencies to ensure that they reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of; increase diversion of solid waste, as appropriate; and maintain cost-effective waste prevention and recycling programs at their facilities. Additionally, in *Federal Register* Volume 58 Number 18 (January 29, 1993), CEQ provides guidance to Federal agencies on how to “incorporate pollution prevention principles, techniques, and mechanisms into their planning and decisionmaking processes and to evaluate and report those efforts, as appropriate, in documents pursuant to NEPA.”

The Resource Conservation and Recovery Act (RCRA) of 1976 is an amendment to the Solid Waste Disposal Act. RCRA authorizes USEPA to provide for “cradle-to-grave” management of hazardous waste and sets a framework for the management of nonhazardous municipal solid waste. Under RCRA, hazardous waste is controlled from generation to disposal through tracking and permitting systems, and restrictions and controls on the placement of waste on or into the land. Under RCRA, a waste is defined as hazardous if it is ignitable, corrosive, reactive, toxic, or listed by USEPA as being hazardous. With the Hazardous and Solid Waste Amendments (HSWA) of 1984, Congress targeted stricter standards for waste disposal and encouraged pollution prevention by prohibiting the land disposal of particular wastes. The HSWA strengthens control of both hazardous and nonhazardous waste and emphasizes the prevention of pollution of groundwater.

The Superfund Amendments and Reauthorization Act (SARA) of 1986 mandates strong clean-up standards and authorizes USEPA to use a variety of incentives to encourage settlements. Title III of SARA authorizes the Emergency Planning and Community Right to Know Act (EPCRA), which requires facility operators with “hazardous substances” or “extremely hazardous substances” to prepare comprehensive emergency plans and to report accidental releases. If a Federal agency acquires a contaminated site, it can be held liable for cleanup as the property owner/operator. A Federal agency can also incur liability if it leases a property, as the courts have found lessees liable as “owners.” However, if the agency exercises due diligence by conducting a Phase I Environmental Site Assessment, it can claim

the “innocent purchaser” defense under CERCLA. According to Title 42 United States Code (U.S.C.) 9601(35), the current owner/operator must show it undertook “all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice” before buying the property to use this defense.

The Toxic Substance Control Act (TSCA) of 1976 consists of four titles. Title I established requirements and authorities to identify and control toxic chemical hazards to human health and the environment. TSCA authorized USEPA to gather information on chemical risks, require companies to test chemicals for toxic effects, and regulate chemicals with unreasonable risk. TSCA also singled out polychlorinated biphenyls (PCBs) for regulation, and, as a result, PCBs are being phased out. PCBs are persistent when released into the environment and accumulate in the tissues of living organisms. They have been shown to cause adverse health effects on laboratory animals and could cause adverse health effects in humans. TSCA and its regulations govern the manufacture, processing, distribution, use, marking, storage, disposal, clean-up, and release reporting requirements for numerous chemicals like PCBs. TSCA Title II provides statutory framework for “Asbestos Hazard Emergency Response,” which applies only to schools. TSCA Title III, “Indoor Radon Abatement,” states indoor air in buildings of the United States should be as free of radon as the outside ambient air. Federal agencies are required to conduct studies on the extent of radon contamination in buildings they own. TSCA Title IV, “Lead Exposure Reduction,” directs Federal agencies to “conduct a comprehensive program to promote safe, effective, and affordable monitoring, detection, and abatement of lead-based paint and other lead exposure hazards.” Further, any Federal agency having jurisdiction over a property or facility must comply with all Federal, state, interstate, and local requirements concerning lead-based paint.

## **Energy**

The Energy Policy Act (EPAc) of 2005, P.L. 109-58, amended portions of the National Energy Conservation Policy Act and established energy management goals for Federal facilities and fleets. Section 109 of EPAc directs that new Federal buildings (commercial or residential) be designed 30 percent below American Society of Heating, Refrigerating, and Air-Conditioning Engineers standards or the International Energy Code. Section 109 also includes the application of sustainable design principles for new buildings and requires Federal agencies to identify new buildings in their budget requests that meet or exceed the standards. Section 203 of EPAc requires that all Federal agencies’ renewable electricity consumption meet or exceed 3 percent from FY 2007 through FY 2009, with increases to at least 5 percent in FY 2010 through FY 2012 and 7.5 percent in FY 2013 and thereafter. Section 203 also establishes a double credit bonus for Federal agencies if renewable electricity is produced onsite at a Federal facility, on Federal lands, or on Native American lands. Section 204 of EPAc establishes a photovoltaic energy commercialization program for Federal buildings.

EO 13514, *Federal Leadership In Environmental, Energy, And Economic Performance* (dated October 5, 2009), directs Federal agencies to improve water use efficiency and management; implement high performance sustainable Federal building design, construction, operation and management; and advance regional and local integrated planning by identifying and analyzing impacts from energy usage and alternative energy sources. EO 13514 also directs Federal agencies to prepare and implement a Strategic Sustainability Performance Plan to manage its greenhouse gas emissions, water use, pollution prevention, regional development and transportation planning, sustainable building design and promote sustainability in its acquisition of goods and services. Section 2(g) requires new construction, major renovation, or repair and alteration of buildings to comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings. The CEQ regulations at 40 CFR 1502.16(e) directs agencies to consider the energy requirements and conservation potential of various alternatives and mitigation measures.

Section 503(b) of EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, instructs Federal agencies to conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically, and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. EO 13423 sets goals in energy efficiency, acquisition, renewable energy, toxic chemical reduction, recycling, sustainable buildings, electronics stewardship, fleets, and water conservation. Sustainable design measures such as the use of “green” technology (e.g., photovoltaic panels, solar collection, heat recovery systems, wind turbines, green roofs, and habitat-oriented storm water management) would be incorporated where practicable.

### **Environmental Performance Standards at the Massachusetts Military Reservation**

As part of the 2001 *Final Area-wide Environmental Impact Report for the Massachusetts National Guard Properties at the Massachusetts Military Reservation*, environmental performance standards were created to protect resources and to manage the activities of the Massachusetts National Guard at the Massachusetts Military Reservation. The environmental performance standards, revised in July 2007, were developed with the consensus of many individuals and agencies and form the common basis and understanding for good environmental stewardship. The environmental performance standards are designed to be incorporated into more comprehensive management programs and to guide future planning and implementation efforts. The environmental performance standards include resource specific standards and general activity standards. Resource specific standards include those that protect groundwater, wetlands and surface water, rare species, soil conservation, vegetation management, habitat management, wildlife management, air quality, noise management, pest management, fire management, storm water management, wastewater, solid waste, hazardous materials, hazardous waste, vehicle performance standards, cultural resources, and general use and access; general activity performance standards are designed to guide military operations in a manner that is consistent regulatory standards.

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## **APPENDIX C**

### **AGENCY COORDINATION AND PUBLIC INVOLVEMENT MATERIALS**



## Intergovernmental Review Distribution Letters



United States Army Corps of Engineers  
New England District  
696 Virginia Road  
Concord, MA 01742-2751

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Sir or Madam:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation and solicit comments on the attached Draft Environmental Assessment for this Proposed Action. Also enclosed is a copy of the distribution list of other Federal, state, and local agencies to be contacted regarding this Proposed Action. If you feel there are any additional individuals who should review and comment on the Draft Environmental Assessment, please feel free to include them in your distribution of this letter and the attached materials.

Please provide any comments or information within 30 days from the date shown on this letter by mail to Camp Edwards UTES and RTI EA, c/o HDR Inc., 375 East Elm Street, Suite 110, Conshohocken, Pennsylvania, 19428 or by email to david.boyes@hdrinc.com.

If your staff has any questions on this Proposed Action, please contact our point-of-contact with the MAARNG, Mr. Keith Driscoll, at 508-233-6512 or keith.driscoll@us.army.mil.

Sincerely,  
**HDR**

A handwritten signature in dark ink, appearing to read "D. Boyes", is written over a light gray rectangular background.

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



United States Department of Agriculture  
Natural Resources Conservation Service  
451 West Street  
Amherst, MA 01002-2953  
Attn: Christine Clarke, State Conservationist

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Ms. Clarke:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

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Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745





United States Environmental Protection Agency  
USEPA, Region 1  
5 Post Office Square - Suite 100  
Boston, MA 02109-3912  
Attn: Curt Spalding, Regional Administrator

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Mr. Spalding:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation and solicit comments on the attached Draft Environmental Assessment for this Proposed Action. Also enclosed is a copy of the distribution list of other Federal, state, and local agencies to be contacted regarding this Proposed Action. If you feel there are any additional individuals who should review and comment on the Draft Environmental Assessment, please feel free to include them in your distribution of this letter and the attached materials.

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If your staff has any questions on this Proposed Action, please contact our point-of-contact with the MAARNG, Mr. Keith Driscoll, at 508-233-6512 or keith.driscoll@us.army.mil.

Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



United States Fish & Wildlife Service  
Office of the Regional Director  
300 Westgate Center Drive  
Hadley, MA 01035-9589  
Attn: Marvin Moriarty, Regional Director

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Mr. Moriarty:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation and solicit comments on the attached Draft Environmental Assessment for this Proposed Action. Also enclosed is a copy of the distribution list of other Federal, state, and local agencies to be contacted regarding this Proposed Action. If you feel there are any additional individuals who should review and comment on the Draft Environmental Assessment, please feel free to include them in your distribution of this letter and the attached materials.

Please provide any comments or information within 30 days from the date shown on this letter by mail to Camp Edwards UTES and RTI EA, c/o HDR Inc., 375 East Elm Street, Suite 110, Conshohocken, Pennsylvania, 19428 or by email to david.boyes@hdrinc.com.

If your staff has any questions on this Proposed Action, please contact our point-of-contact with the MAARNG, Mr. Keith Driscoll, at 508-233-6512 or keith.driscoll@us.army.mil.

Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



Massachusetts Department of Environmental Protection  
One Winter Street  
Boston, MA 02108  
Attn: Laurie Burt, Commissioner

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Ms. Burt:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation and solicit comments on the attached Draft Environmental Assessment for this Proposed Action. Also enclosed is a copy of the distribution list of other Federal, state, and local agencies to be contacted regarding this Proposed Action. If you feel there are any additional individuals who should review and comment on the Draft Environmental Assessment, please feel free to include them in your distribution of this letter and the attached materials.

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If your staff has any questions on this Proposed Action, please contact our point-of-contact with the MAARNG, Mr. Keith Driscoll, at 508-233-6512 or [keith.driscoll@us.army.mil](mailto:keith.driscoll@us.army.mil).

Sincerely,  
**HDR**

A handwritten signature in dark ink, appearing to read 'D. Boyes'.

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



Massachusetts Department of Environmental Protection  
Division of Water, Wastewater & Wetlands  
One Winter Street  
Boston, MA 02108  
Attn: Steven McCurdy, Division Director

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Mr. McCurdy:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation and solicit comments on the attached Draft Environmental Assessment for this Proposed Action. Also enclosed is a copy of the distribution list of other Federal, state, and local agencies to be contacted regarding this Proposed Action. If you feel there are any additional individuals who should review and comment on the Draft Environmental Assessment, please feel free to include them in your distribution of this letter and the attached materials.

Please provide any comments or information within 30 days from the date shown on this letter by mail to Camp Edwards UTES and RTI EA, c/o HDR Inc., 375 East Elm Street, Suite 110, Conshohocken, Pennsylvania, 19428 or by email to [david.boyes@hdrinc.com](mailto:david.boyes@hdrinc.com).

If your staff has any questions on this Proposed Action, please contact our point-of-contact with the MAARNG, Mr. Keith Driscoll, at 508-233-6512 or [keith.driscoll@us.army.mil](mailto:keith.driscoll@us.army.mil).

Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



Massachusetts Department of Conservation and Recreation  
Planning and Engineering  
251 Causeway Street, Suite 600  
Boston, MA 02114-2104  
Attn: Joe Orfant, Director

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Mr. Orfant:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation and solicit comments on the attached Draft Environmental Assessment for this Proposed Action. Also enclosed is a copy of the distribution list of other Federal, state, and local agencies to be contacted regarding this Proposed Action. If you feel there are any additional individuals who should review and comment on the Draft Environmental Assessment, please feel free to include them in your distribution of this letter and the attached materials.

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If your staff has any questions on this Proposed Action, please contact our point-of-contact with the MAARNG, Mr. Keith Driscoll, at 508-233-6512 or keith.driscoll@us.army.mil.

Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



Massachusetts Department of Conservation and Recreation  
Division of Water Supply Protection  
251 Causeway Street, Suite 600  
Boston, MA 02114-2104  
Attn: Jonathan Yeo, Director

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Mr. Yeo:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation and solicit comments on the attached Draft Environmental Assessment for this Proposed Action. Also enclosed is a copy of the distribution list of other Federal, state, and local agencies to be contacted regarding this Proposed Action. If you feel there are any additional individuals who should review and comment on the Draft Environmental Assessment, please feel free to include them in your distribution of this letter and the attached materials.

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If your staff has any questions on this Proposed Action, please contact our point-of-contact with the MAARNG, Mr. Keith Driscoll, at 508-233-6512 or keith.driscoll@us.army.mil.

Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



Massachusetts Historical Commission  
State Historic Preservation Officer  
200 Morrissey Boulevard  
Boston, MA 02125  
Attn: Brona Simon, Executive Director

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Ms. Simon:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

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If your staff has any questions on this Proposed Action, please contact our point-of-contact with the MAARNG, Mr. Keith Driscoll, at 508-233-6512 or keith.driscoll@us.army.mil.

Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745





State Commission for Conservation of Soil, Water & Related Resources  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, Suite 900  
Boston, MA 02114-2524  
Attn: Thomas C. Anderson, Executive Secretary

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Mr. Anderson:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation and solicit comments on the attached Draft Environmental Assessment for this Proposed Action. Also enclosed is a copy of the distribution list of other Federal, state, and local agencies to be contacted regarding this Proposed Action. If you feel there are any additional individuals who should review and comment on the Draft Environmental Assessment, please feel free to include them in your distribution of this letter and the attached materials.

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If your staff has any questions on this Proposed Action, please contact our point-of-contact with the MAARNG, Mr. Keith Driscoll, at 508-233-6512 or keith.driscoll@us.army.mil.

Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745





State Commission for Conservation of Soil, Water & Related Resources  
Cape Cod Conservation District  
P.O. Box 678  
Barnstable, MA 02630

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Sir or Madam:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

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Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



University of Massachusetts, Amherst  
Department of Natural Resources Conservation  
University of Massachusetts  
160 Holdsworth Way; Room 225  
Amherst, MA 01003-9285  
Attn: Professor Paul Fisette, Department Head

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Professor Fisette:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

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Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



Town of Bourne  
Town Hall  
24 Perry Avenue  
Buzzards Bay, MA 02532  
Attn: Thomas Guerino, Town Administrator

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Mr. Guerino:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

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Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



Town of Mashpee  
16 Great Neck Road North  
Mashpee, MA 02649  
Attn: Joyce M. Mason, Town Administrator

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Ms. Mason:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

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Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



Town of Sandwich  
130 Main Street  
Sandwich, MA 02563  
Attn: George Dunham, Town Administrator

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Mr. Dunham:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

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Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



Town of Falmouth  
59 Town Hall Square  
Falmouth, MA 02540  
Attn: Julian Suso, Town Manager

JUL 17 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Mr. Suso:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

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If your staff has any questions on this Proposed Action, please contact our point-of-contact with the MAARNG, Mr. Keith Driscoll, at 508-233-6512 or keith.driscoll@us.army.mil.

Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745



Environmental Management Commission  
ATTN: Mark Begley  
Building 1204 West Inner Road  
Camp Edwards, MA 02542-5003

OCT 03 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Mr. Begley:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

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If your staff has any questions on this Proposed Action, please contact our point-of-contact with the MAARNG, Mr. Keith Driscoll, at 508-233-6512 or keith.driscoll@us.army.mil.

Sincerely,  
**HDR**

David Boyes  
Project Manager

Attachment: Environmental Assessment

Distribution list: See Section 9 of Attachment

HDR

375 East Elm Street, Suite 110, Conshohocken, PA 19428 • (610) 397-1744 • Fax (610) 397-1745





REPLY TO  
ATTENTION OF:

DEPARTMENTS OF THE ARMY AND THE AIR FORCE  
JOINT FORCE HEADQUARTERS  
MASSACHUSETTS NATIONAL GUARD  
OFFICE OF THE ADJUTANT GENERAL  
50 MAPLE STREET  
MILFORD, MA 01757-3604

Wampanoag Tribe of Gay Head - Aquinnah  
20 Black Brook Road  
Aquinnah, MA 02535  
Attn: Ms. Bettina Washington, Tribe Historic Preservation Officer

JUL 24 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Ms. Washington:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

In accordance with Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments* and the *National Historic Preservation Act of 1966*, the MAARNG is providing you the attached Draft Environmental Assessment for this Proposed Action to solicit comments on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribe. Please accept this letter to initiate coordination with your tribe regarding this action.

Please provide any comments or information within 30 days from the date shown on this letter by mail to Camp Edwards UTES and RTI EA, c/o HDR Inc., 375 East Elm Street, Suite 110, Conshohocken, Pennsylvania, 19428 or by email to [david.boyes@hdrinc.com](mailto:david.boyes@hdrinc.com).

If your staff has any questions on this Proposed Action, please contact me, Mr. Keith Driscoll, at 508-233-6512 or [keith.driscoll@us.army.mil](mailto:keith.driscoll@us.army.mil).

Sincerely,

Keith Driscoll  
MAARNG

Attachment: Environmental Assessment





DEPARTMENTS OF THE ARMY AND THE AIR FORCE  
JOINT FORCE HEADQUARTERS  
MASSACHUSETTS NATIONAL GUARD  
OFFICE OF THE ADJUTANT GENERAL  
50 MAPLE STREET  
MILFORD, MA 01757-3604

REPLY TO  
ATTENTION OF:

Mashpee Wampanoag Tribal Council  
P.O. Box 1048  
483 Great Neck Road South  
Mashpee, MA 02649  
Attn: Ms. Ramona Peters, Tribal Historic Preservation Officer

JUL 24 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Ms. Peters:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

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If your staff has any questions on this Proposed Action, please contact me, Mr. Keith Driscoll, at 508-233-6512 or [keith.driscoll@us.army.mil](mailto:keith.driscoll@us.army.mil).

Sincerely,

Keith Driscoll  
MAARNG

Attachment: Environmental Assessment



DEPARTMENTS OF THE ARMY AND THE AIR FORCE  
JOINT FORCE HEADQUARTERS  
MASSACHUSETTS NATIONAL GUARD  
OFFICE OF THE ADJUTANT GENERAL  
50 MAPLE STREET  
MILFORD, MA 01757-3604

REPLY TO  
ATTENTION OF:

Stockbridge - Munsee Tribe of Mohican, Wisconsin  
W13447 Camp 14 Road  
P.O. Box 70  
Bowler, WI 54416  
Attn: Sherry White, Tribal Historic Preservation Officer

JUL 24 2012

**Subject:** Preparation of an Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts.

Dear Ms. White:

The Massachusetts Army National Guard (MAARNG) proposes to construct and operate a replacement Unit Training Equipment Site (UTES) with associated infrastructure and facilities and to construct and operate two additional buildings for the Massachusetts Regional Training Institute (RTI) at Camp Edwards in Barnstable County, Massachusetts.

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If your staff has any questions on this Proposed Action, please contact me, Mr. Keith Driscoll, at 508-233-6512 or [keith.driscoll@us.army.mil](mailto:keith.driscoll@us.army.mil).

Sincerely,

Keith Driscoll  
MAARNG

Attachment: Environmental Assessment

## Responses to Intergovernmental Review Distribution Letters



**The Commonwealth of Massachusetts**  
William Francis Galvin, Secretary of the Commonwealth  
Massachusetts Historical Commission

July 24, 2012

Keith Driscoll  
Regional Cultural Resource Manager  
Massachusetts National Guard  
50 Maple Street  
Milford, MA 01757-3604

RE: Camp Edwards, Unit Training Equipment Site & Two New Buildings, Massachusetts Regional Training Institute, MHC #RC.51667.

Dear Mr. Driscoll:

Staff of the Massachusetts Historical Commission (MHC), office of the State Historic Preservation Officer, have reviewed the draft *Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts*.

After review of the information submitted and the MHC's files, MHC recommends a finding of "no historic properties affected" (36 CFR 800.4(d)(1)) for this undertaking.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800) and M.G.L. c. 9, ss. 26-27C (950 CMR 71). Please contact me if you have any questions.

Sincerely,

A handwritten signature in dark ink, appearing to read "E. Bell".

Edward L. Bell  
Deputy State Historic Preservation Officer  
Massachusetts Historical Commission

xc:  
Matthew McKay, Mass Army National Guard  
David Boyes, HDR Inc.

220 Morrissey Boulevard, Boston, Massachusetts 02125  
(617) 727-8470 • Fax: (617) 727-5128  
[www.state.ma.us/sec/mhc](http://www.state.ma.us/sec/mhc)

# Stockbridge-Munsee Tribal Historic Preservation Office

Sherry White - Tribal Historic Preservation Officer

W13447 Camp 14 Road

P.O. Box 70

Bowler, WI 54416

Date 7/26/18

Project Number Camp Edwards UTES

TCNS Number \_\_\_\_\_

Company Name NDR Inc

We have received your letter for the above listed project. Before we can process the request we need more information. The additional items needed are checked below.

## Additional Information Required:

- ☐ Site visit by Tribal Historic Preservation Officer
- ☐ Archeological survey, Phase 1
- ☐ Colored maps
- ☐ Pictures of the site
- ☐ Any reports the State Historic Preservation Office may have
- ☐ Review fee of \$300.00 must be included with letter
- ☐ Has site been previously disturbed, please explain what the use was and when it was disturbed

## After reviewing your letter:

- ☐ We are in the process of gathering more information on this site and will respond to your project request once all information has been gathered.
- ☐ This project has the potential to affect a Mohican cultural site, please contact us
- ☒ This project is not within Mohican area of interest
- ☐ This project is within Mohican territory, but we are not aware of any cultural site within the project area.

Additional

comments project area is outside traditional homeland

Should this project inadvertently uncover a Native American site, we require you to halt all construction and notify the Stockbridge-Munsee Tribe immediately.

Please do not resubmit projects for changes that are not ground disturbance

*Sherry White* /s.w.

Sherry White, Tribal Historic Preservation Officer

(715) 793-3970

Email: [sherry.white@mohican-nsn.gov](mailto:sherry.white@mohican-nsn.gov)

**From:** Miller, Barbara - NRCS, Amherst, MA [<mailto:barbara.miller@ma.usda.gov>]  
**Sent:** Monday, August 13, 2012 3:45 PM  
**To:** Boyes, David  
**Subject:** Camp Edwards UTES and RTI EA

David,

I have reviewed the EA submitted by your firm. The concerns that Natural Resources Conservation Service (NRCS) would have would revolve around soils, water resources and land use change. Since the new construction will be on land already disturbed and create no new impervious surface or disturb prime farm soil, we do not have any pertinent comments.

Thank you,

Barbara

[Barbara P. Miller](#)

State Resource Conservationist  
Farm Bill Program Manager  
Natural Resources Conservation Service  
451 West Street, Amherst, MA 01002  
413-253-4380

**NOTICE to Hispanic or Women Farmers:** If you believe USDA improperly denied you farm loan benefits during 1981-2000, see [farmerclaims.gov](http://farmerclaims.gov) for info.

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**From:** Begley, Mark (DEP) [mailto:mark.begley@state.ma.us]  
**Sent:** Saturday, October 13, 2012 2:23 PM  
**To:** McKay, Matthew D Mr CIV US NG MA ARNG  
**Subject:** draft comments on draft EA

Dear Mr. Boyes,

Thank you for providing a copy of the Draft Environmental Assessment for comment. As you know the Draft EA is addressing construction and operation of two projects including the Unit Training Equipment Site which is proposed to be build immediately adjacent to the Upper Cape Water Supply Reserve and the northern training area of Camp Edwards.

The Draft EA is clear, factual, and appropriately detailed in many areas. An exception is found on page 3-15, line 30. The proposed UTES location is inside, not outside, of one or more water supply Zone II areas. How that fact fits with the mention of the Site Consolidation Plan's criteria that the "...UTES should be...outside water supply recharge areas" should be clarified on page 3-2, lines 47 and 48.

A correction is also needed in line 4 on page 1-4. the sentence states the current army lease expires in 2026 when in fact it expires in 2051.

The Draft EA, including Sections 1.4, 1.5.1, and Appendix B, is silent on the Environmental Performance Standards developed for the Massachusetts National Guard Properties at the Massachusetts Military Reservation, including the Cantonment Area, as part of the Massachusetts National Guard's 2001 Final Environmental Impact Report Informational Supplement. Those Standards were to be part of future planning and implementation efforts for all projects in the Cantonment area such as those proposed in this Draft EA. The Performance Standards cover siting and design performance standards, traffic, circulation and parking around buildings, litter, etc.

I hope these comments are useful to you and I appreciate the chance to comment.

Thank you,  
Mark J. Begley  
Executive Director  
Environmental Management Commission  
Building 1204, W. Inner Rd.  
Camp Edwards, MA 02542

Office: 508 968 5127  
Fax: 508 968 5128  
Classification: UNCLASSIFIED  
Caveats: NONE



# MAARNG's responses to comments on the Draft EA

<p align="center"><b>Annotated Comment Response Matrix</b> for the <b>Draft Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts</b></p>			
#	Extracted Comment	Reviewer	MAARNG Response
1.	<p>After review of the information submitted and the MHC's files, MHC recommends a finding of "no historic properties affected" (36 CFR 800.4(d)(1)) for this undertaking.</p> <p><b>After reviewing your letter:</b></p> <p><input type="checkbox"/> We are in the process of gathering more information on this site and will respond to your project request once all information has been gathered.</p> <p><input type="checkbox"/> This project has the potential to affect a Mohican cultural site, please contact us</p> <p><input checked="" type="checkbox"/> This project is not within Mohican area of interest</p> <p><input type="checkbox"/> This project is within Mohican territory, but we are not aware of any cultural site within the project area.</p> <p>Additional comments _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p><b>Should this project inadvertently uncover a Native American site, we require you to halt all construction and notify the Stockbridge-Munsee Tribe immediately.</b></p>	M.A. Historic Commission	<p>The MAARNG agrees with this finding.</p> <p>Thank you for your comment. The MAARNG would consult with the Stockbridge-Munsee Tribe if a Native American site is inadvertently uncovered during construction; however, such a discovery is unlikely to occur.</p>
2.	<p>_____</p> <p><i>project area is outside traditional boundary</i></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p><b>Should this project inadvertently uncover a Native American site, we require you to halt all construction and notify the Stockbridge-Munsee Tribe immediately.</b></p>	Stockbridge	
3.	<p>The concerns that Natural Resources Conservation Service (NRCS) would have would revolve around soils, water resources and land use change. Since the new construction will be on land already disturbed and create no new impervious surface or disturb prime farm soil, we do not have any pertinent comments.</p> <p>Thank you, Barbara</p>	BM	Thank you for your comment.

Annotated Comment Response Matrix for the Draft Environmental Assessment Addressing the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute at Camp Edwards, Massachusetts			
#	Extracted Comment	Reviewer	MAARNG Response
4.	<p>The Draft EA is clear, factual, and appropriately detailed in many areas. An exception is found on page 3-15, line 30. The proposed UTES location is inside, not outside, of one or more water supply Zone II areas. How that fact fits with the mention of the Site Consolidation Plan's criteria that the "...UTES should be...outside water supply recharge areas" should be clarified on page 3-2, lines 47 and 48.</p> <p>A correction is also needed in line 4 on page 1-4. the sentence states the current army lease expires in 2026 when in fact it expires in 2051.</p> <p>The Draft EA, including Sections 1.4, 1.5.1, and Appendix B, is silent on the Environmental Performance Standards developed for the Massachusetts National Guard Properties at the Massachusetts Military Reservation, including the Cantonment Area, as part of the Massachusetts National Guard's 2001 Final Environmental Impact Report Informational Supplement. Those Standards were to be part of future planning and implementation efforts for all projects in the Cantonment area such as those proposed in this Draft EA. The Performance Standards cover siting and design performance standards, traffic, circulation and parking around buildings, litter, etc.</p>	MB	Thank you for your comments. The MAARNG has made multiple edits to the EA to note the Zone II areas, to correct the year when the lease expires, and to include the environmental performance standards.

Reviewer: Please provide your name, title, commercial phone number, email address, and date of comments

- MA Historic Commission – Massachusetts Historical Commission, Edward L. Bell, Deputy State Historic Preservation Officer, 24 July 2012.
- Stockbridge – Stockbridge-Munsee Tribal Historic Preservation Office, Sherry White, Tribal Historic Preservation Officer, 26 July 2012.
- BM – Barbara P. Miller, NRCS, Amherst, Farm Bill Program Manager, 413-253-4380, 13 August 2012.
- MB – Mark J. Begley, Environmental Management Commission, Executive Director, 508-968-5127, 13 October 2012.



## The MAARNG Memorandum for the Record on Tribal Consultation



DEPARTMENTS OF THE ARMY AND THE AIR FORCE  
MASSACHUSETTS NATIONAL GUARD  
OFFICE OF THE ADJUTANT GENERAL  
60 MAPLE STREET  
MILFORD, MA 01757-3604

REPLY TO  
ATTENTION OF:

29 March 2013

MAARNG-CFMO-ENV

### MEMORANDUM FOR RECORD

SUBJECT: Tribal Consultation for the Construction and Operation of a Unit Training Equipment Site and the Addition of Two New Buildings at the Regional Training Institute

1. Tribal consultation was initiated via formal letters sent with both the draft and final environmental assessments submitted by the Massachusetts Army National Guard (MAARNG) to the three federally-recognized tribes recorded as having cultural affiliation and interest within the Commonwealth of Massachusetts on 24 July 2012 (see proceeding pages for letters sent to the identified tribes). Tribes were invited to participate as consulting parties for the undertakings on Camp Edwards Massachusetts, defined as the construction and operation of a Unit Training Equipment Site and the addition of two new buildings at the Regional Training Institute and the associated ground disturbance.

2. The three tribes invited to participate as consulting parties were:

The Wampanoag Tribe of Gay Head -- Aquinnah  
Mashpee Wampanoag Tribe  
Stockbridge – Munsee Tribe of Mohican

3. The NGB received one response from the Stockbridge-Munsee Tribe of Mohican on 26 July 2012. They commented that the project area is outside traditional homeland. Neither the Wampanoag Tribe of Gay Head -- Aquinnah and the Mashpee Wampanoag Tribe have initiated contact with the MAARNG.

4. Points of contact for this action is the undersigned at 508-233-6512 or keith.j.driscoll.nfg@mail.mil.

Encl  
as

A handwritten signature in black ink, appearing to read "Keith J. Driscoll", is written over the typed name.

Keith J. Driscoll  
Massachusetts Army National Guard  
Cultural Resources Program Manager

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## **APPENDIX D**

### **AIR EMISSIONS CALCULATIONS**



<b>Summary</b>	Summarizes total emissions by calendar year for the UTES component of the Proposed Action.
<b>Combustion</b>	Estimates emissions from non-road equipment exhaust.
<b>Fugitive</b>	Estimates particulate emissions from construction and demolition activities including earthmoving, vehicle traffic, and windblown dust.
<b>Grading</b>	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
<b>Haul Truck On-Road</b>	Estimates emissions from haul trucks hauling materials to/from the job site.
<b>Construction Commuter</b>	Estimates emissions for construction and demolition workers commuting to the job site.
<b>Emergency Generator</b>	Estimates emissions from the operation of an emergency generator.
<b>AQCR Tier Report</b>	Summarizes total emissions for the Metropolitan Providence Interstate (MPI) Air Quality Control Region Tier report for 2008, to be used to compare the UTES component of the Proposed Action to regional emissions.

### Air Emissions for the UTES Component of the Proposed Action

	NO <sub>x</sub> (ton)	VOC (ton)	CO (ton)	SO <sub>2</sub> (ton)	PM <sub>10</sub> (ton)	PM <sub>2.5</sub> (ton)	CO <sub>2</sub> (ton)
Combustion	6.168	0.675	2.667	0.495	0.428	0.415	709.431
Fugitive Dust	-	-	-	-	21.923	2.192	-
Haul Truck On-Road	0.738	0.533	2.168	0.058	0.877	0.228	186.747
Commuter	0.132	0.132	1.190	0.002	0.013	0.008	157.778
<b>Total (Year 1: C &amp; D Only)</b>	<b>7.038</b>	<b>1.340</b>	<b>6.024</b>	<b>0.555</b>	<b>23.241</b>	<b>2.844</b>	<b>1,053.956</b>
Emergency Generator	5.463	0.140	1.451	0.003	0.171	0.171	281.690
<b>Total (All Subsequent Years)</b>	<b>5.463</b>	<b>0.140</b>	<b>1.451</b>	<b>0.003</b>	<b>0.171</b>	<b>0.171</b>	<b>281.690</b>

Note: Total PM<sub>10/2.5</sub> fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO <sub>2</sub> emissions converted to metric tons =	<b>955.938</b>	<b>metric tons (Year 1)</b>	<b>255.493</b>	<b>metric tons (Sub. Years)</b>
State of Massachusetts's CO <sub>2</sub> emissions =	<b>71,000,000</b>	<b>metric tons</b>	<i>(U.S. DOE/EIA 2011)</i>	
Percent of Massachusetts's CO <sub>2</sub> emissions =	<b>0.00135%</b>	<b>Year 1</b>	<b>0.00036%</b>	<b>Subsequent Years</b>
United States' CO <sub>2</sub> emissions =	<b>5,425,600,000</b>	<b>metric tons</b>	<i>(U.S. DOE/EIA 2011)</i>	
Percent of USA's CO <sub>2</sub> emissions =	<b>0.000018%</b>	<b>Year 1</b>	<b>0.000005%</b>	<b>Subsequent Years</b>

Source: U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA). 2011. *Table 1. State Emissions by Year (Million Metric Tons of Carbon Dioxide)*. Available online <[http://www.eia.gov/environment/emissions/state/state\\_emissions.cfm](http://www.eia.gov/environment/emissions/state/state_emissions.cfm)>. Data released October 2011. Data accessed 14 February 2012.

Since future year budgets were not readily available, actual 2008 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

### Metropolitan Providence Interstate (MPI) Air Quality Control Region

Year	All Emission Sources					
	NO <sub>x</sub> (tpy)	VOC (tpy)	CO (tpy)	SO <sub>2</sub> (tpy)	PM <sub>10</sub> (tpy)	PM <sub>2.5</sub> (tpy)
2008	67,883	85,406	507,429	50,161	75,451	13,630

Source: USEPA National Emissions Inventory (NEI) (<http://neibrowser.epa.gov/eis-public-web/home.html>). Site visited on 14 February 2012.

### Air Emissions from the UTES Component of the Proposed Action

	All Emission Sources					
	NO <sub>x</sub> (tpy)	VOC (tpy)	CO (tpy)	SO <sub>2</sub> (tpy)	PM <sub>10</sub> (tpy)	PM <sub>2.5</sub> (tpy)
Regional Emissions	67,883	85,406	507,429	50,161	75,451	13,630
Emissions (Year 1)	7.038	1.340	6.024	0.555	23.241	2.844
<b>% of Regional (Year 1)</b>	<b>0.010%</b>	<b>0.002%</b>	<b>0.001%</b>	<b>0.001%</b>	<b>0.031%</b>	<b>0.021%</b>
Emissions (All Subsequent Years)	5.463	0.140	1.451	0.003	0.171	0.171
<b>% of Regional (All Subsequent Years)</b>	<b>0.008%</b>	<b>0.000%</b>	<b>0.000%</b>	<b>0.000%</b>	<b>0.000%</b>	<b>0.001%</b>

Summary  
Estimated Emissions for UTES Component

## Combustion Emissions

Combustion Emissions of VOC, NO<sub>x</sub>, SO<sub>2</sub>, CO, PM<sub>2.5</sub>, PM<sub>10</sub>, and CO<sub>2</sub> due to Construction and Demolition

General Construction and Demolition Activities	Area Disturbed	Source
1.) Construct New UTES Facility	49,044 ft <sup>2</sup>	Provided in Section 2.1
2.) Construct Controlled-Humidity Building	20,000 ft <sup>2</sup>	Provided in Section 2.1
3.) Demolish Existing UTES Facility (Building 4601)	25,200 ft <sup>2</sup>	Provided in Section 1.2.2
4.) Construct Concrete Paved Storage Lot (7 Acres)	304,920 ft <sup>2</sup>	Provided in Section 2.1
5.) Construct New Sidewalks	13,400 ft <sup>2</sup>	Provided in Section 2.1
6.) Construct POV Parking	18,000 ft <sup>2</sup>	Estimated from Figure 2-1
7.) Construct Perimeter Fence	9,000 ft <sup>2</sup>	Assume 3 feet wide
Total Building Construction Area:	69,044 ft <sup>2</sup> 1.59 acres	Lines 1 and 2
Total Building Demolition Area:	25,200 ft <sup>2</sup> 0.58 acres	Line 3
Total Pavement Area:	336,320 ft <sup>2</sup> 7.72 acres	Lines 4, 5, 6
Total Disturbed Area:	439,564 ft <sup>2</sup> 10.09 acres	Lines 1 through 7
Construction Duration:	12 months	
Annual Construction Activity:	240 days	Assume 4 weeks per month, 5 days per week.

The total construction and demolition process is anticipated to last for about 2 years; however, for the purposes of this air quality analysis, construction and demolition is calculated as occurring in only 1 year, 2013. As a result, the emission estimates in this air quality analysis are conservative.

## Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0

Emission factors are taken from the NONROAD model and were provided to e2M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.

Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

### Grading

Equipment	No. Req <sup>d</sup> . <sup>a</sup> per 10 acres	NO <sub>x</sub> (lb/day)	VOC <sup>b</sup> (lb/day)	CO (lb/day)	SO <sub>2</sub> <sup>c</sup> (lb/day)	PM <sub>10</sub> (lb/day)	PM <sub>2.5</sub> (lb/day)	CO <sub>2</sub> (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	3.45	2.55	2.47	4941.53

### Paving

Equipment	No. Req <sup>d</sup> . <sup>a</sup> per 10 acres	NO <sub>x</sub> (lb/day)	VOC <sup>b</sup> (lb/day)	CO (lb/day)	SO <sub>2</sub> <sup>c</sup> (lb/day)	PM <sub>10</sub> (lb/day)	PM <sub>2.5</sub> (lb/day)	CO <sub>2</sub> (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	3.93	2.78	2.69	5623.96

### Demolition

Equipment	No. Req <sup>d</sup> . <sup>a</sup> per 10 acres	NO <sub>x</sub> (lb/day)	VOC <sup>b</sup> (lb/day)	CO (lb/day)	SO <sub>2</sub> <sup>c</sup> (lb/day)	PM <sub>10</sub> (lb/day)	PM <sub>2.5</sub> (lb/day)	CO <sub>2</sub> (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	2.58	1.92	1.87	3703.07

### Building Construction

Equipment <sup>d</sup>	No. Req <sup>d</sup> . <sup>a</sup> per 10 acres	NO <sub>x</sub> (lb/day)	VOC <sup>b</sup> (lb/day)	CO (lb/day)	SO <sub>2</sub> <sup>c</sup> (lb/day)	PM <sub>10</sub> (lb/day)	PM <sub>2.5</sub> (lb/day)	CO <sub>2</sub> (lb/day)
<b>Stationary</b>								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
<b>Mobile (non-road)</b>								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page



### Architectural Coatings

Equipment	No. Req <sup>d</sup> . <sup>a</sup> per 10 acres	NO <sub>x</sub> (lb/day)	VOC <sup>b</sup> (lb/day)	CO (lb/day)	SO <sub>2</sub> <sup>c</sup>	PM <sub>10</sub> (lb/day)	PM <sub>2.5</sub> (lb/day)	CO <sub>2</sub> (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

- The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.
- The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.
- The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO<sub>2</sub> emissions by more than a factor of two.
- Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

## PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO <sub>x</sub>	VOC	CO	SO <sub>2</sub> **	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Grading Equipment	1	41.641	2.577	15.710	3.449	2.546	2.469	4941.526
Paving Equipment	1	45.367	2.606	18.578	3.926	2.776	2.693	5623.957
Demolition Equipment	1	31.808	1.886	12.584	2.585	1.923	1.865	3703.074
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			21.415					

\*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

\*\*Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NO<sub>x</sub> = (Total Grading NO<sub>x</sub> per 10 acre)\*(Equipment Multiplier)

### Summary of Input Parameters

	Total Area (ft <sup>2</sup> )	Total Area (acres)	Total Days	
Grading:	439,564	10.09	5	(from "Grading" worksheet)
Paving:	336,320	7.72	37	
Demolition:	25,200	0.58	29	
Building Construction:	69,044	1.59	240	
Architectural Coating:	69,044	1.59	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition.

## Total Project Emissions by Activity (lbs)

	NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Grading Equipment	208.21	12.88	78.55	17.25	12.73	12.35	24,708
Paving	1,678.59	96.41	687.40	145.25	102.72	99.63	208,086
Demolition	922.42	54.68	364.93	74.96	55.77	54.10	107,389
Building Construction	9,455.12	751.15	4,171.75	747.92	678.97	658.60	1,071,483
Architectural Coatings	71.48	435.77	31.31	5.02	6.19	6.00	7,195
<b>Total Emissions (lbs):</b>	<b>12,335.81</b>	<b>1,350.90</b>	<b>5,333.94</b>	<b>990.41</b>	<b>856.37</b>	<b>830.68</b>	<b>1,418,861</b>

## Results: Total Project Annual Emission Rates

	NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Total Project Emissions (lbs)	12,335.81	1,350.90	5,333.94	990.41	856.37	830.68	1,418,861
Total Project Emissions (tons)	6.168	0.675	2.667	0.495	0.428	0.415	709.431

## Construction Fugitive Dust Emissions

### Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
Construction and Demolition Activities	0.19	ton PM <sub>10</sub> /acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM <sub>10</sub> /acre-month	MRI 1996; EPA 2001; EPA 2006

### PM<sub>2.5</sub> Emissions

PM <sub>2.5</sub> Multiplier	0.10	(10% of PM <sub>10</sub> emissions assumed to be PM <sub>2.5</sub> )	EPA 2001; EPA 2006
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### Control Efficiency

0.50	(assume 50% control efficiency for PM <sub>10</sub> and PM <sub>2.5</sub> emissions)	EPA 2001; EPA 2006
------	--	--------------------

### Project Assumptions

#### *New Roadway Construction (0.42 ton PM<sub>10</sub>/acre-month)*

Duration of Construction Project	12 months
Area	7.72 acres

#### *General Construction and Demolition Activities (0.19 ton PM<sub>10</sub>/acre-month)*

Duration of Project	12 months
Area	2.16 acres

	Project Emissions (tons/year)			
	PM <sub>10</sub> uncontrolled	PM <sub>10</sub> controlled	PM <sub>2.5</sub> uncontrolled	PM <sub>2.5</sub> controlled
New Roadway Construction	38.913	19.457	3.891	1.946
General Construction Activities	4.933	2.466	0.493	0.247
<b>Total</b>	<b>43.846</b>	<b>21.923</b>	<b>4.385</b>	<b>2.192</b>

## Construction Fugitive Dust Emission Factors

### General Construction Activities Emission Factor

**0.19 ton PM<sub>10</sub>/acre-month** Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM<sub>10</sub>/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM<sub>10</sub>/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM<sub>10</sub>/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM<sub>10</sub>/acre-month) and 75% of the average emission factor (0.11 ton PM<sub>10</sub>/acre-month). The 0.19 ton PM<sub>10</sub>/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM<sub>10</sub>/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM<sub>10</sub> and PM<sub>2.5</sub> in PM nonattainment areas.

### New Road Construction Emission Factor

**0.42 ton PM<sub>10</sub>/acre-month** Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM<sub>10</sub>/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM<sub>10</sub>/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

### PM<sub>2.5</sub> Multiplier

**0.10**

PM<sub>2.5</sub> emissions are estimated by applying a particle size multiplier of 0.10 to PM<sub>10</sub> emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

### Control Efficiency for PM<sub>10</sub> and PM<sub>2.5</sub>

**0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM<sub>10</sub> and PM<sub>2.5</sub> in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

### References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999*. EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants*. Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1)*. Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

## Grading Schedule

Estimate of time required to grade a specified area.

### Input Parameters

Construction area: 10.09 acres/yr (from Combustion Worksheet)  
Qty Equipment: 4.00 (calculated based on 3 pieces of equipment for every 10 acres)

### Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

### Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day	equip-days per acre	Acres/yr (project- specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	10.09	1.26
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	10.09	4.93
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	5.05	5.09
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	5.05	2.09
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	10.09	3.54
TOTAL								16.91

### Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 16.91  
Qty Equipment: 4.00  
Grading days/yr: 4.23

## Haul Truck Emissions

Emissions from hauling excavation material, construction supplies, and demolition debris are estimated in this spreadsheet.  
 Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

### Assumptions:

Haul trucks carry 20 cubic yards of material per trip.

The average distance from the project site to the materials source is 15 miles; therefore, a haul truck will travel 30 miles round trip.

Estimated number of trips required by haul trucks = total amount of material/20 cubic yards per truck

All excavation and fill material would be hauled from the site.

Amount of Building Materials (Aboveground) =	10,229 cubic yards	Assumes 4 feet of building material are needed for each floor
Amount of Building Materials (Belowground) =	12,786 cubic yards	Assumes 5 feet of building material are needed for the below ground portion of the building
Amount of Excavation Material For New Construction=	30,686 cubic yards	Assumes 12 feet of excavation material would be produced on average
Amount of Demolition Debris =	3,733 cubic yards	Assumes 4 feet of demolition debris are produced per floor
Amount of Fill Material for Demolition=	11,200 cubic yards	Assumes 12 feet of fill material would be needed to fill in the building foundation
Number of trucks required =	3432 heavy duty diesel haul truck trips	
Miles per trip =	30 miles	

### Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
HDDV	6.5	4.7	19.1	0.512	7.73	2.01	1645.605

Notes:

Emission factors for all pollutants except CO<sub>2</sub> are from USAF IERA 2003.

Emission factors for PM, PM<sub>10</sub>, SO<sub>x</sub> are from HDDV in Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO<sub>x</sub> are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

Diesel fuel produces 22.384 pounds of CO<sub>2</sub> per gallon.

It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)

CO<sub>2</sub> emission factor = 22.384 lbs CO<sub>2</sub>/gallon diesel \* gallon diesel/6.17 miles \* 453.6 g/lb

### HDDV Haul Truck Emissions

	NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
lbs	1475.273	1066.736	4335.032	116.206	1754.440	456.200	373494.756
tons	0.738	0.533	2.168	0.058	0.877	0.228	186.747

Example Calculation: NO<sub>x</sub> emissions (lbs) = 30 miles per trip \* 369 trips \* NO<sub>x</sub> emission factor (g/mile) \* lb/453.6 g

## Construction Commuter Emissions

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>.

Assumptions:

Passenger vehicle emission factors for scenario year 2010 are used.

The average roundtrip commute for a construction worker = 30 miles  
 Number of construction days = 240 days  
 Number of construction workers (daily) = 40 people

### Passenger Vehicle Emission Factors for Year 2010 (lbs/mile)

NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated April 24, 2008. Available online: <<http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>>. Accessed 27 May 2009.

Notes:

The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC.

## Construction Commuter Emissions

	NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
lbs	264.425	263.229	2379.674	3.103	25.050	15.777	315556.516
tons	0.132	0.132	1.190	0.002	0.013	0.008	157.778

Example Calculation: NO<sub>x</sub> emissions (lbs) = 60 miles/day \* NO<sub>x</sub> emission factor (lb/mile) \* number of construction days \* number of workers

## Calculates Air Emissions from an Emergency Generator at the UTES

Number of Generators: 1  
 Generator Power Rating: 1 megawatt  
 Generator Fuel: Diesel

Generator Kilowatts		Conversion from kW to Btu/hr	Engine Btu/hr (Assume 30% efficiency converting mechanical to electrical power)	Engine MMBtu/hr
1000		3414.4	11,381,420	11.38

Diesel Industrial Engine Emission Factors from AP-42, Section 3.4	NOx	CO	VOC	PM-10	SO <sub>2</sub>	CO <sub>2</sub>
	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu
Emission Factor	3.2	0.85	0.082	0.1	0.001515	165

Source: USEPA 1996. AP-42. Large Stationary Diesel And All Stationary Dual-fuel Engines. Table 3.4-1. Page 3.4-5.

Assume max. 300 hrs/yr	NOx	CO	VOC	PM-10	SO <sub>2</sub>	CO <sub>2</sub>
	(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)
Emissions (lbs/yr)	10,926.16	2,902.26	279.98	341.44	5.17	563,380.27

	NOx	CO	VOC	PM-10	SO <sub>2</sub>	CO <sub>2</sub>
	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
Emissions (tons/yr)	5.463	1.451	0.140	0.171	0.003	281.690



**Metropolitan Providence Interstate (MPI) Air Quality Control Region**

Row #	State	County	All Emission Sources					
			CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOC
1	IL	Barnstable	59,043	6,769	11,470	1,913	5,656	10,521
2	IL	Bristol	59,210	14,683	14,144	2,522	34,334	12,659
3	IL	Dukes	8,265	1,292	1,633	316	451	1,789
4	IL	Nantucket	6,477	781	549	145	241	1,177
5	IL	Norfolk	131,498	15,580	11,025	2,055	2,556	19,491
6	IL	Plymouth	59,688	8,650	24,253	3,053	2,482	12,449
7	RI	Bristol	6,858	680	371	126	211	1,269
8	RI	Kent	31,658	2,984	1,686	500	581	4,308
9	RI	Newport	16,432	1,703	910	247	617	3,003
10	RI	Providence	98,007	12,054	7,208	1,954	2,410	14,365
11	RI	Washington	30,292	2,706	2,203	798	624	4,374
Grand Total			507,429	67,883	75,451	13,630	50,161	85,406

**SOURCE:**

<http://neibrowser.epa.gov/eis-public-web/home.html>

USEPA National Emissions Inventory (NEI)

<b>Summary</b>	Summarizes total emissions by calendar year for the RTI component of the Proposed Action
<b>Combustion</b>	Estimates emissions from non-road equipment exhaust.
<b>Fugitive</b>	Estimates particulate emissions from construction activities including earthmoving, vehicle traffic, and windblown dust.
<b>Grading</b>	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
<b>Haul Truck On-Road</b>	Estimates emissions from haul trucks hauling materials to the job site.
<b>Construction Commuter</b>	Estimates emissions for construction workers commuting to the site.
<b>AQCR Tier Report</b>	Summarizes total emissions for the Metropolitan Providence Interstate Air Quality Control Region Tier report for 2008, to be used to compare the RTI component of the Proposed Action to regional emissions.

### Air Emissions for the RTI component of the Proposed Action

	NO <sub>x</sub> (ton)	VOC (ton)	CO (ton)	SO <sub>2</sub> (ton)	PM <sub>10</sub> (ton)	PM <sub>2.5</sub> (ton)	CO <sub>2</sub> (ton)
Combustion	4.807	0.578	2.119	0.380	0.345	0.335	544.622
Fugitive Dust	-	-	-	-	1.828	0.183	-
Haul Truck On-Road	0.670	0.484	1.969	0.053	0.797	0.207	169.614
Commuter	0.099	0.099	0.892	0.001	0.009	0.006	118.334
<b>TOTAL</b>	<b>5.576</b>	<b>1.161</b>	<b>4.980</b>	<b>0.434</b>	<b>2.980</b>	<b>0.731</b>	<b>832.569</b>

Note: Total PM<sub>10/2.5</sub> fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO <sub>2</sub> emissions converted to metric tons =	<b>755.140</b>	<b>metric tons</b>	
State of Massachusetts's CO <sub>2</sub> emissions =	<b>71,000,000</b>	<b>metric tons</b>	(U.S. DOE/EIA 2011)
Percent of Massachusetts's CO <sub>2</sub> emissions =	<b>0.00106%</b>		
United States' CO <sub>2</sub> emissions =	<b>5,425,600,000</b>	<b>metric tons</b>	(U.S. DOE/EIA 2011)
Percent of USA's CO <sub>2</sub> emissions =	<b>0.000014%</b>		

Source: U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA). 2011. *Table 1. State Emissions by Year (Million Metric Tons of Carbon Dioxide)*. Available online <[http://www.eia.gov/environment/emissions/state/state\\_emissions.cfm](http://www.eia.gov/environment/emissions/state/state_emissions.cfm)>. Data released October 2011. Data accessed 14 February 2012.

Since future year budgets were not readily available, actual 2008 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

### Metropolitan Providence Interstate Intrastate Air Quality Control Region

Year	All Emission Sources					
	NO <sub>x</sub> (tpy)	VOC (tpy)	CO (tpy)	SO <sub>2</sub> (tpy)	PM <sub>10</sub> (tpy)	PM <sub>2.5</sub> (tpy)
2008	67,883	85,406	507,429	50,161	75,451	13,630

Source: USEPA National Emissions Inventory (NEI) (<http://neibrowser.epa.gov/eis-public-web/home.html>). Site visited on 14 February 2012.

### Air Emissions from the RTI component of the Proposed Action

All Emission Sources					
NO <sub>x</sub> (tpy)	VOC (tpy)	CO (tpy)	SO <sub>2</sub> (tpy)	PM <sub>10</sub> (tpy)	PM <sub>2.5</sub> (tpy)
67,883	85,406	507,429	50,161	75,451	13,630
5.576	1.161	4.980	0.434	2.980	0.731
<b>0.008%</b>	<b>0.001%</b>	<b>0.001%</b>	<b>0.001%</b>	<b>0.004%</b>	<b>0.005%</b>

Regional Emissions  
Emissions  
% of Regional

## Combustion Emissions

Combustion Emissions of VOC, NO<sub>x</sub>, SO<sub>2</sub>, CO, PM<sub>2.5</sub>, PM<sub>10</sub>, and CO<sub>2</sub> due to Construction

General Construction and Demolition Activities	Area Disturbed	Source
1.) Construct New Education Building	25,913 ft <sup>2</sup>	Provided in Section 2.2
2.) Construct New Barracks	32,125 ft <sup>2</sup>	Provided in Section 2.2
3.) Construct New Sidewalks	4,000 ft <sup>2</sup>	Provided in Section 2.2
4.) Construct Paving for Reconfigured Parking Lot	1,350 ft <sup>2</sup>	Provided in Section 2.2
Total Construction Area:	58,038 ft <sup>2</sup> 1.33 acres	Lines 1 and 2
Total Demolition Area:	0 ft <sup>2</sup> 0.00 acres	None
Total Pavement Area:	5,350 ft <sup>2</sup> 0.12 acres	Lines 3 and 4
Total Disturbed Area:	63,388 ft <sup>2</sup> 1.46 acres	Lines 1 through 4
Construction Duration:	12 months	
Annual Construction Activity:	240 days	Assume 4 weeks per month, 5 days per week.

## Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0

Emission factors are taken from the NONROAD model and were provided to e2M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.

Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

### Grading

Equipment	No. Req <sup>d</sup> . <sup>a</sup> per 10 acres	NO <sub>x</sub> (lb/day)	VOC <sup>b</sup> (lb/day)	CO (lb/day)	SO <sub>2</sub> <sup>c</sup> (lb/day)	PM <sub>10</sub> (lb/day)	PM <sub>2.5</sub> (lb/day)	CO <sub>2</sub> (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	3.45	2.55	2.47	4941.53

### Paving

Equipment	No. Req <sup>d</sup> . <sup>a</sup> per 10 acres	NO <sub>x</sub> (lb/day)	VOC <sup>b</sup> (lb/day)	CO (lb/day)	SO <sub>2</sub> <sup>c</sup> (lb/day)	PM <sub>10</sub> (lb/day)	PM <sub>2.5</sub> (lb/day)	CO <sub>2</sub> (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	3.93	2.78	2.69	5623.96

### Demolition

Equipment	No. Req <sup>d</sup> . <sup>a</sup> per 10 acres	NO <sub>x</sub> (lb/day)	VOC <sup>b</sup> (lb/day)	CO (lb/day)	SO <sub>2</sub> <sup>c</sup> (lb/day)	PM <sub>10</sub> (lb/day)	PM <sub>2.5</sub> (lb/day)	CO <sub>2</sub> (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	2.58	1.92	1.87	3703.07

### Building Construction

Equipment <sup>d</sup>	No. Req <sup>d</sup> . <sup>a</sup> per 10 acres	NO <sub>x</sub> (lb/day)	VOC <sup>b</sup> (lb/day)	CO (lb/day)	SO <sub>2</sub> <sup>c</sup> (lb/day)	PM <sub>10</sub> (lb/day)	PM <sub>2.5</sub> (lb/day)	CO <sub>2</sub> (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page

### Architectural Coatings

Equipment	No. Req <sup>d</sup> . <sup>a</sup> per 10 acres	NO <sub>x</sub> (lb/day)	VOC <sup>b</sup> (lb/day)	CO (lb/day)	SO <sub>2</sub> <sup>c</sup>	PM <sub>10</sub> (lb/day)	PM <sub>2.5</sub> (lb/day)	CO <sub>2</sub> (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

- The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.
- The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.
- The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO<sub>2</sub> emissions by more than a factor of two.
- Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

## PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO <sub>x</sub>	VOC	CO	SO <sub>2</sub> **	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Grading Equipment	1	41.641	2.577	15.710	3.449	2.546	2.469	4941.526
Paving Equipment	1	45.367	2.606	18.578	3.926	2.776	2.693	5623.957
Demolition Equipment	1	31.808	1.886	12.584	2.585	1.923	1.865	3703.074
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			19.634					

\*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

\*\*Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NO<sub>x</sub> = (Total Grading NO<sub>x</sub> per 10 acre)\*(Equipment Multiplier)

### Summary of Input Parameters

	Total Area (ft <sup>2</sup> )	Total Area (acres)	Total Days	
Grading:	63,388	1.46	1	(from "Grading" worksheet)
Paving:	5,350	0.12	1	
Demolition:	0	0.00	0	
Building Construction:	58,038	1.33	240	
Architectural Coating	58,038	1.33	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition.

## Total Project Emissions by Activity (lbs)

	NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Grading Equipment	41.64	2.58	15.71	3.45	2.55	2.47	4,942
Paving	45.37	2.61	18.58	3.93	2.78	2.69	5,624
Demolition	-	-	-	-	-	-	0
Building Construction	9,455.12	751.15	4,171.75	747.92	678.97	658.60	1,071,483
Architectural Coatings	71.48	400.15	31.31	5.02	6.19	6.00	7,195
<b>Total Emissions (lbs):</b>	<b>9,613.61</b>	<b>1,156.49</b>	<b>4,237.35</b>	<b>760.32</b>	<b>690.48</b>	<b>669.76</b>	<b>1,089,244</b>

## Results: Total Project Annual Emission Rates

	NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
Total Project Emissions (lbs)	9,613.61	1,156.49	4,237.35	760.32	690.48	669.76	1,089,244
Total Project Emissions (tons)	4.807	0.578	2.119	0.380	0.345	0.335	544.622

## Construction Fugitive Dust Emissions

### Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
Construction and Demolition Activities	0.19	ton PM <sub>10</sub> /acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM <sub>10</sub> /acre-month	MRI 1996; EPA 2001; EPA 2006

### PM<sub>2.5</sub> Emissions

PM <sub>2.5</sub> Multiplier	0.10	(10% of PM <sub>10</sub> emissions assumed to be PM <sub>2.5</sub> )	EPA 2001; EPA 2006
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### Control Efficiency

0.50	(assume 50% control efficiency for PM <sub>10</sub> and PM <sub>2.5</sub> emissions)	EPA 2001; EPA 2006
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### Project Assumptions

#### *New Roadway Construction (0.42 ton PM<sub>10</sub>/acre-month)*

Duration of Construction Project	12 months
Area	0.12 acres

#### *General Construction and Demolition Activities (0.19 ton PM<sub>10</sub>/acre-month)*

Duration of Project	12 months
Area	1.33 acres

	Project Emissions (tons/year)			
	PM <sub>10</sub> uncontrolled	PM <sub>10</sub> controlled	PM <sub>2.5</sub> uncontrolled	PM <sub>2.5</sub> controlled
New Roadway Construction	0.619	0.310	0.062	0.031
General Construction Activities	3.038	1.519	0.304	0.152
<b>Total</b>	<b>3.657</b>	<b>1.828</b>	<b>0.366</b>	<b>0.183</b>



## Construction Fugitive Dust Emission Factors

### General Construction Activities Emission Factor

**0.19 ton PM<sub>10</sub>/acre-month** Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM<sub>10</sub>/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM<sub>10</sub>/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM<sub>10</sub>/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM<sub>10</sub>/acre-month) and 75% of the average emission factor (0.11 ton PM<sub>10</sub>/acre-month). The 0.19 ton PM<sub>10</sub>/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM<sub>10</sub>/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM<sub>10</sub> and PM<sub>2.5</sub> in PM nonattainment areas.

### New Road Construction Emission Factor

**0.42 ton PM<sub>10</sub>/acre-month** Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM<sub>10</sub>/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM<sub>10</sub>/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

### PM<sub>2.5</sub> Multiplier

**0.10**

PM<sub>2.5</sub> emissions are estimated by applying a particle size multiplier of 0.10 to PM<sub>10</sub> emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

### Control Efficiency for PM<sub>10</sub> and PM<sub>2.5</sub>

**0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM<sub>10</sub> and PM<sub>2.5</sub> in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

### References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999*. EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants*. Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1)*. Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

## Grading Schedule

Estimate of time required to grade a specified area.

### Input Parameters

Construction area: 1.46 acres/yr (from Combustion Worksheet)  
Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

### Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

### Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day	equip-days per acre	Acres/yr (project- specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	1.46	0.18
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	1.46	0.71
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	0.73	0.73
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	0.73	0.30
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	1.46	0.51
TOTAL								2.44

### Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 2.44  
Qty Equipment: 3.00  
Grading days/yr: 0.81

## Haul Truck Emissions

Emissions from hauling excavation material and construction supplies are estimated in this spreadsheet.  
 Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

### Assumptions:

Haul trucks carry 20 cubic yards of material per trip.

The average distance from the project site to the materials source is 15 miles; therefore, a haul truck will travel 30 miles round trip.

Estimated number of trips required by haul trucks = total amount of material/20 cubic yards per truck

All excavation would be hauled from the site.

Amount of Building Materials (Aboveground) =	25,795 cubic yards	Assumes 4 feet of building material are needed for each floor
Amount of Building Materials (Belowground) =	10,748 cubic yards	Assumes 5 feet of building material are needed for the below ground portion of the building
Amount of Excavation Material =	25,795 cubic yards	Assumes 12 feet of excavation material would be produced on average
Number of trucks required =	3117 heavy duty diesel haul truck trips	
Miles per trip =	30 miles	

### Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
<i>HDDV</i>	<b>6.5</b>	<b>4.7</b>	<b>19.1</b>	<b>0.512</b>	<b>7.73</b>	<b>2.01</b>	<b>1645.605</b>

Notes:

Emission factors for all pollutants except CO<sub>2</sub> are from USAF IERA 2003.

Emission factors for PM, PM<sub>10</sub>, SO<sub>x</sub> are from HDDV in Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO<sub>x</sub> are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

Diesel fuel produces 22.384 pounds of CO<sub>2</sub> per gallon.

It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)

CO<sub>2</sub> emission factor = 22.384 lbs CO<sub>2</sub>/gallon diesel \* gallon diesel/6.17 miles \* 453.6 g/lb

### HDDV Haul Truck Emissions

	NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
<b>lbs</b>	<b>1339.918</b>	<b>968.864</b>	<b>3937.298</b>	<b>105.544</b>	<b>1593.472</b>	<b>414.344</b>	<b>339227.041</b>
<b>tons</b>	<b>0.670</b>	<b>0.484</b>	<b>1.969</b>	<b>0.053</b>	<b>0.797</b>	<b>0.207</b>	<b>169.614</b>

Example Calculation: NO<sub>x</sub> emissions (lbs) = 30 miles per trip \* 369 trips \* NO<sub>x</sub> emission factor (g/mile) \* lb/453.6 g

## Construction Commuter Emissions

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>.

Assumptions:

Passenger vehicle emission factors for scenario year 2010 are used.

The average roundtrip commute for a construction worker = 30 miles  
 Number of construction days = 240 days  
 Number of construction workers (daily) = 30 people

### Passenger Vehicle Emission Factors for Year 2010 (lbs/mile)

NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated April 24, 2008. Available online: <<http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>>. Accessed 27 May 2009.

Notes:

The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC.

## Construction Commuter Emissions

	NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2</sub>
lbs	198.318	197.421	1784.755	2.327	18.787	11.833	236667.387
tons	0.099	0.099	0.892	0.001	0.009	0.006	118.334

Example Calculation: NO<sub>x</sub> emissions (lbs) = 60 miles/day \* NO<sub>x</sub> emission factor (lb/mile) \* number of construction days \* number of workers

**Metropolitan Providence Interstate (MPI) Air Quality Control Region**

Row #	State	County	All Emission Sources					
			CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOC
1	IL	Barnstable	59,043	6,769	11,470	1,913	5,656	10,521
2	IL	Bristol	59,210	14,683	14,144	2,522	34,334	12,659
3	IL	Dukes	8,265	1,292	1,633	316	451	1,789
4	IL	Nantucket	6,477	781	549	145	241	1,177
5	IL	Norfolk	131,498	15,580	11,025	2,055	2,556	19,491
6	IL	Plymouth	59,688	8,650	24,253	3,053	2,482	12,449
7	RI	Bristol	6,858	680	371	126	211	1,269
8	RI	Kent	31,658	2,984	1,686	500	581	4,308
9	RI	Newport	16,432	1,703	910	247	617	3,003
10	RI	Providence	98,007	12,054	7,208	1,954	2,410	14,365
11	RI	Washington	30,292	2,706	2,203	798	624	4,374
Grand Total			507,429	67,883	75,451	13,630	50,161	85,406

**SOURCE:**

<http://neibrowser.epa.gov/eis-public-web/home.html>

USEPA National Emissions Inventory (NEI)

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